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# USSR Report

MILITARY AFFAIRS

AVIATION AND COSMONAUTICS

No 5, MAY 1986

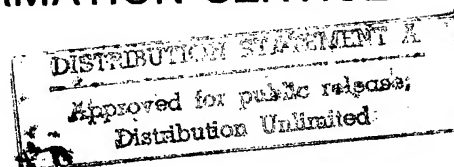
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14 AUGUST 1986

## USSR REPORT MILITARY AFFAIRS

### AVIATION AND COSMONAUTICS

No 5, May 1986

Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal AVIATSIYA I KOSMONAVTIKA published in Moscow.

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COLONEL GENERAL PANKIN ON TASKS OF AIR FORCE IN LIGHT OF CONGRESS

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 1-3

[Article by Honored Military Pilot USSR Col Gen Avn V. Pankin, chief of Air Force Main Staff and first deputy commander in chief of the Air Force, delegate to the the 27th CPSU Congress: "Toward Heights of Military Skill"]

[Text] Inspired by the historic decisions of the the 27th CPSU Congress, the Soviet people, under the guidance of the Communist Party -- a tested and proven fighting vanguard which unites the leading, most conscious segment of the worker class, kolkhoz peasantry and intelligentsia -- is striding confidently forward, following a Leninist course along a difficult, pioneer road of building a communist society. A component part of the international communist movement, the CPSU is helping strengthen cooperation among the brother socialist countries, is promoting unity of the world socialist system, and is displaying solidarity with peoples fighting for their national and social liberation, against imperialism, and for preserving peace on earth.

The 27th CPSU Congress demonstrated particularly forcefully the magnitude of the role played by the Communist Party in our country's affairs and in international relations. An objective appraisal of the state of affairs in today's world, fundamental trends in their development as well as conflicts was presented at the congress, and the achievements of the Soviet society on the road to building communism were comprehensively analyzed. The congress defined the principal directions of party economic and social policy and our country's affairs up to the year 2000 and mandated a clear-cut course of foreign policy directed toward holding the arms race in check and strengthening world peace. The 27th CPSU Congress was an event of truly unfading historical, world significance.

Our country accomplished a great and difficult journey following the Great October Socialist Revolution. By their glorious deeds Soviet citizens affirmed new societal relations and created the material and technological foundation for a society of free labor, equality and brotherhood, a society without exploitation and without antagonisms. But our people were forced to defend the achievements of the Great October Revolution in savage struggle with the imperialist aggressors. The Great Patriotic War, which ended in the crushing defeat of Hitlerite Fascism and Japanese militarism, was a most

severe test of the strength of the Soviet State. The Soviet people are celebrating the 41st anniversary of our glorious Holiday of Victory. The date 9 May is dear to the heart of each of us, not only from the warm memory of those who died for the socialist homeland. It serves to remind the living of the severe sacrifices and deprivations with which war is fraught. One must have the ability to defend world peace. The cost of losing vigilance and of complacency can be too great.

The difficult situation today requires that we be alert. As was noted in the CPSU Central Committee Political Report to the 27th CPSU Congress by CPSU Central Committee General Secretary Comrade M. S. Gorbachev, "the world of capital has not abandoned the ideology and policy of hegemonism; its rulers continue to cling to the hope of social revanche, and they continue to harbor illusions of prevailing by superior power." Proceeding from their aggressive policy, the imperialist states are stepping up military preparations and are building up the combat potential of their armed forces at an accelerated pace. The greedy schemes of aggressive U.S. circles to implement the so-called "Strategic Defense Initiative," which prescribes placing offensive weapons into orbit in order to threaten from space the Soviet Union and the other socialist countries with a nuclear fist and to hold the world on the brink of military catastrophe, present a particular danger to the cause of peace.

In these conditions, as is noted in the CPSU Program, the party will make every effort to ensure that the USSR Armed Forces maintain a level which prevents the possibility of military superiority by imperialism, to ensure comprehensive improvement of the defense capability of the Soviet State and strengthening of the fighting alliance of the armed forces of the brother socialist nations. Our servicemen, totally dedicated to the party and people, are keeping an alert eye on the aggressive intrigues of the enemies of peace and socialism and are standing vigilant guard over the productive labor of the Soviet people.

Our country's working people look to the future with optimism and are working selflessly and with great enthusiasm to achieve the targets of the 12th Five-Year Plan. The 27th CPSU Congress has armed them with a clear program of action and has mapped out a firm course aimed at accelerating the socioeconomic development of the Soviet society. The essence of this acceleration lies in a new quality of growth: all-out intensification of production on a foundation of scientific and technological advance, structural reorganization of the economy, and efficient forms of management, organization of labor and work incentive. This course of policy prescribes an aggressive social policy and consistent affirmation of the principle of socialist justice. But a strategy of acceleration presupposes improvement of societal relations, updating of the forms and methods of operation of political and ideological institutions, and overcoming inertia, stagnation and conservatism -- everything that holds back societal advance.

Military aviation personnel, responding with their minds and hearts to the decisions of this highest party forum of Soviet Communists, unanimously approve of and totally support the political and socioeconomic strategy and tactics worked out at the congress which call for accelerated movement toward a qualitatively new state of the Soviet society, and by their daily military

labor are making a substantial contribution toward accomplishing the truly grandiose tasks of building socialism. The results of combat and political training as well as socialist competition in the winter training period indicate that the majority of Air-Force collectives have achieved additional success in accomplishing their assigned tasks. The combat proficiency of aircrews and subunits has increased considerably, discipline and organization have become stronger, and the ideological-political and psychological conditioning of personnel has risen to a higher level. Today commanders, political agencies and party organizations are more critically approaching analysis of the state of affairs and are assessing their own successes and deficiencies in a more rigorous and exacting manner. People are more boldly proposing ways to accomplish the difficult tasks of combat and political training. Empty display and unnecessary situation simplification, inertness of thinking and predictable routine in actions are being increasingly more vigorously eradicated from military collectives.

Guided by the party's demands that the focus of attention be shifted from quantitative to qualitative indices, from intermediate to end results, commanders, staff and political agency officers, flight and engineer-technician personnel of aviation units and subunits are seeking to achieve genuine improvement in the quality of job proficiency and combat readiness in the process of combat training. The military collectives led by officer A. Iabkovskiy, delegate to the 27th CPSU Congress, officers A. Zhukovin, V. Kopytov, V. Logunov, V. Levchenko, and A. Khokhlov occupy vanguard positions among those outfits which have successfully met socialist pledges in the winter period of training. Their experience attests to the fact that with intelligent organization of combat training and party-political work, personnel can handle even the most difficult tasks. It is essential to organize one's work in such a manner that unabating attention is focused on key problems which to a decisive degree determine success and sure advance toward a high level of military skill. These include first and foremost problems pertaining to further improvement of management and administrative activity at all echelons, from top to bottom, selection and placement of leader cadres, all-out strengthening of military discipline and rule of law, and instilling in airmen a high sense of awareness and personal responsibility for the results of their labor. A most important task of military councils, commanders, staffs, political agencies and party organizations, noted Army Gen A. D. Lizichev, chief of the Main Political Directorate of the Soviet Army and Navy, at the Conference of Army and Navy Ideological Workers held in March 1986, consists in conveying to each and every serviceman the wealth of ideas and the essence and spirit of the decisions of the 27th CPSU Congress. We must increase people's political enthusiasm and businesslike attitude, transforming the potential of concepts and ideas into the energy of specific, critical actions in one's assigned area.

One must learn to work innovatively and in a new manner in order to achieve such a situation. This requires radical reexamination and change in the style of one's activities, the techniques, forms and methods of leadership. It is very important first of all to gain a thorough understanding of what hinders people from applying vanguard methods and fully utilizing their capabilities. So-called "paper" style, which attests to the fact that certain officials are isolated from practical affairs, was condemned at the congress. Unfortunately

this also occurs in the military. Higher authorities, considering the actual requirements of command and control, prepare the requisite documents, which of course should be implemented. But it frequently occurs that certain documents are redundant, duplicating one another, for they are prepared without considering the specific features of the different air components, their function, and basing conditions. Such paper shuffling does not promote clear-cut organization of command and control.

There is no question that guideline documents regulating combat training and party-political work in Air-Force units are essential. And when such documents are received, their implementation should be treated in a most serious manner. Unfortunately, in some outfits they are not studied sufficiently thoroughly, and their instructions are not perceived as a guide to action. This results in a gap between what should be done and what is observed in actuality. Thorough knowledge of the requirements of guideline documents and the ability to communicate them to personnel and correctly to organize their practical implementation is one of the indicators of the professional maturity of the leader, military job proficiency, and competence in staff duties and management.

In aviation affairs any inexactitudes are fraught with dangerous consequences. As we know, departures from the rules and regulations governing flight activities frequently result in failure to accomplish the mission and threaten flight safety. Prior to making a decision or issuing an order, a commander should thoroughly think everything through and ensure that his subordinates correctly understand the decision or order. This particularly applies to staff officers, because the headquarters staff is that agency which communicates a commander's decisions to the men and organizes execution of decisions and verification of execution. Clarity and conciseness of decision and promptness in preparing the requisite documents make it possible to put all instruments of execution rapidly into motion.

A large flow of diversified information is received at headquarters, information which must be processed and the most important elements extracted in order to reach an optimal decision. Scientific and technological advance has given the commander and his staff officers an effective means which facilitates working with virtually any volume of information -- the computer. It enables one to classify data, to perform operational-tactical and engineering-navigation computations quickly and accurately, and to improve the efficiency of command and control and the quality of preparing aircrews and subunits to perform a specific assignment. And one must have the ability fully to utilize these capabilities of the computer.

The computer eliminates the need to perform tiresome and monotonous operations and helps one rapidly test and check predictions and projections, compare different solution variations, analyze them and choose the best one. The interest and fascination of working with a computer constitutes itself a factor which increases an officer's creative potential and intellect. Mastering the computer is no simple matter. One must first of all acquire a working knowledge of a specialized computer language, the fundamentals of programming, algorithms of various computations, working procedures, and skills in problem formulation. The practical adoption of computers in combat

training and staff operations is an urgent demand of the times, required by practical realities and practical military activities. Officer personnel, especially flight personnel, must master the use of electronic calculators both during commander training and independently. This is a guarantee of future success in achieving combat proficiency.

Highly-effective technical devices are being delivered to Air-Force units, which are meeting the requirements of flight personnel combat training, staff and support services, although presently not in sufficient quantity in every case. Wherever this equipment is presently lacking, it is important to focus on unutilized reserve potential. For example, modern flight simulator systems, data processing, testing and verification systems are based on digital computers of the same type. It is a relatively simple matter to upgrade any of these systems with displays, printers, plotters, and a disk or tape drive. By developing the appropriate software, one can perform various computing operations: planning and scheduling, preparing flight operations schedules, performing operational-tactical computations, and solving specific problems of combat employment, engineer and rear services support. Utilization of costly equipment will unquestionably be more efficient, and there will be fewer errors in organizing and supporting flight operations. One must merely take a look at available possibilities from the standpoint of good management and fully utilize these possibilities.

I should like to note in this connection that economizing in materiel and resources as well as packing training time more densely are taking on decisive significance in present-day conditions. Some commanders explain away the mistakes and errors of omission in their work as being caused by a shortage of time. The volume of tasks performed by aviation personnel is indeed large, and it will be growing year by year. A catastrophic shortfall occurs as a rule with those command personnel who have not learned how to plan the training process efficiently and to treat each and every minute in a thrifty and conscientious manner. One need not go far afield after examples.

A schedule of training activities, approved by the appropriate senior officers, is prominently displayed at unit and subunit headquarters. The assumption is that this document will be observed to the letter. In actual fact, however, it frequently occurs that classrooms in which classes are scheduled stand empty, and a flight simulator also stands idle. This happens because certain command personnel simply forget to specify on the preceding day what their subunits are scheduled to do, while others are working on routine items of business. At the same time some staff officers believe that it suffices to draw up or check a schedule of training classes, while actual verification is the business of those whose jobs specifically involve the inspection and verification function. This is profoundly erroneous! It is primarily the headquarters staff which should check to ensure precise implementation of the training schedule, point out to the commanding officer bottlenecks in the training process, help correct them in a timely manner and, what is even better, prevent possible gaps or omissions.

With a new approach to organization of the training process, as is indicated by the experience of many Air-Force subunits and units, sufficient time is freed up for orderly, systematic commander training and for increasing the

professional knowledge of specialists of all categories. This depends in large measure on how correctly commanders, staff officers and political workers understand the need to work in the new manner and how clearly executing personnel are made aware of the demands of the present day.

Lt Col N. Karpushkin had proven to be a knowledgeable, competent chief of staff. Possessing stick-to-itiveness, organizing ability, and thorough knowledge of staff affairs, air tactics, and the capabilities of the equipment, he would thoroughly and carefully prepare materials for decision-making. Clearly aware that planning combat and political training is a multifaceted and complicated process, which determines improvement in the combat proficiency of aviation personnel, he actively enlisted the participation of the subunit commanders in these activities. A realistically executable plan would emerge in close contact with them.

Knowledgeable, competent planning and scheduling, however, is only one aspect of the matter. Another, no less important aspect is constant and continuous effective monitoring and verification. Lieutenant Colonel Karpushkin did not ignore a single document or a single planned and scheduled activity. Any failure to adhere to or departure from plans and schedules would be examined in the unit with a thorough analysis of causes. This is a good school of training for leader personnel not only at the squadron but also at the regimental echelon. Lt Col N. Karpushkin has recently been promoted.

Well-planned socialist competition is very helpful to unit and subunit personnel in accomplishing planned combat and political training targets. The headquarters staff plays an important role in socialist competition organization and oversight. Some staff officers, however, hold themselves aloof from this activity, feeling that chiefly commanders and political workers, party and Komsomol organizations should concern themselves with competition. And yet all information on combat training, specific figures and data are collected at headquarters. This means that there is an opportunity here for performing analysis, determining the causes of lagging performance, and formulating recommendations to eliminate them. Unfortunately staff officers frequently either impassively record figures and indices but do not take active part in mobilizing personnel to achieve new successes and in disseminating and synthesizing advanced know-how, forgetting that this is a powerful means of increasing the effectiveness of combat training.

Today it is out of the question to work in the old manner. There is simply no time for mistakes. Each and every airman should become actively involved in the campaign against those negative phenomena which continue to hinder rapid advance, advance toward the heights of military expertise. This means that each and every Air-Force specialist, regardless of his position or job, must reexamine his attitude toward the task at hand and begin reorganization with himself. In the CPSU Central Committee Political Report to the 27th CPSU Congress, CPSU Central Committee General Secretary Comrade M. S. Gorbachev bluntly stated that "as we know, any reorganization of the economic management mechanism begins with reorganization of one's consciousness, discarding of old, established stereotypes of thinking and practical activity, and a clear understanding of the new tasks."

There is plenty of reserve potential for increasing the effectiveness of combat training in Air-Force units and subunits. Some of this reserve potential is standing there for all to see, as they say, but most unutilized potential requires thorough analysis and mobilization. To find this potential, to incorporate it in a practical manner, to achieve in the final analysis a high level of job proficiency and combat readiness in a short period of time is a present important task. The higher the degree of discipline and organization and the feeling of responsibility on the part of each and every individual for achieving the stated goal, the faster we shall advance toward the heights of military expertise. And this will also enhance the prestige of our glorious Air Force.

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## RESPONSIBILITY OF COMMUNISTS FOR COMBAT READINESS EXAMINED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 4-5

[Article, published under the heading "Be Alert, In a Continuous State of Combat Readiness," by Expert-Marksman Military Pilot Col G. Benov, member of Carpathian Military District Air Forces Military Council: "Communist Means Standout"]

[Text] In present-day conditions, when the responsibility of each Communist for his membership in the party and for carrying out party policy is increasing together with enhancement of the party's role, the Leninist behest to raise the title and significance of party member ever higher rings with particular relevance to us. Our time and the magnificence of the tasks which are being accomplished demand of party members that they display personal exemplariness in all areas of their activity and that they increase their activeness, initiative, militance, and sense of responsibility.

Communist means standout. This has today become a determining principle for us. It signifies an attitude by party members toward the task at hand which ensures consistent excellent performance results in military labor and exemplary performance of party and military duty. The Communist should be a standout. CPSU Central Committee General Secretary Comrade M. S. Gorbachev notes: "The vanguard role of the Communist goes beyond the status of general concept: it is expressed in practical deeds."

Following the congress, a rule has become firmly established in the party organizations of our district's air forces: depth of ideological conviction should be measured by concrete deeds. In other words, in assessing the labor of a Communist, one should take into consideration his personal exemplariness and discipline, the degree of his participation in civic affairs, unity of word and deed, party integrity, demandingness on himself and others, and an objective and self-critical attitude toward his actions and deeds.

This is precisely the way they approach things in the party organizations of which Communists N. Kazantsev, A. Furtes, and others are members. In the units in question there has been an appreciable improvement in the air proficiency and technical knowledgeability of personnel and in the proficiency rating of flight and ground personnel. Combat training of aircrews, two-

aircraft elements, and flights is now being conducted in a smoother and more purposeful manner, and greater attention is being devoted to tactics and the mastery of new modes of destroying air and ground targets in today's complex combat environment.

The tactical air exercises held in the new training year were a genuine test of professional competence. Performing missions in an environment maximally approximating actual combat, working in close coordination with ground troops, Air-Force personnel acquired experience in the conduct of coordinated, effective actions against "aggressor" targets on a tight timetable. As always, party members and probationary members march in the front ranks of those who strive for excellent quality of combat training.

It was noted at the 27th CPSU Congress that of great importance in ensuring the vanguard role of Communists are their high degree of responsibility, professional and sociopolitical activism, their initiative and sense of the new. This enables them successfully to solve the most difficult problems. Communists make up the front rank, against whom the entire collective measures its stride. Wherever they are equal to the task, wherever they carry out their vanguard role, things move smoothly and success is achieved in military endeavor.

Today, in light of the demands of the 27th CPSU Congress, it is important to examine how each Communist is carrying out his party and military duty, to determine his ideological conditioning, his moral and ethical principles, and to determine whether he is giving the party-unaffiliated an example to emulate. Unfortunately there still exist many shortcomings in this area.

Recently performance results in combat and political training have declined in the unit in which Lt Col V. Kikot serves as party committee secretary. Not all Communists in this party organization bear in mind their personal responsibility for improving the quality of combat training and for strengthening military discipline. Some party members set no example in performance of job duties and take their time about adopting a firm, principled position.

Unfortunately this is also observed in certain other party collectives. There are officers who accept breaches of discipline and who ignore instances of unnecessary relaxation of demands and situation simplification in combat training, failing to consider how this looks in the eyes of those around them. Some Communists, including leader personnel, also cease to consider the opinion of their comrades and view adverse comments and fair criticism as undermining authority instead of drawing correct conclusions for themselves.

Naturally a party member whose words are at variance with his deeds enjoys no respect. Could the men, for example, have any respect for former squadron commander Lt Col Ye. Mashevskiy, who was guilty of abuse of office? Of course not. It is not surprising that his expulsion from the CPSU and his demotion were received with considerable satisfaction by the men in his outfit.

Some leader-Communists lose their party qualities. As a rule this happens in those party organizations where an atmosphere of complacency has formed, where

there is diminished answerability for observing the prescribed rules, regulations and obligations of a CPSU member, where meaningful criticism and self-criticism are lacking, and where the position taken by high-principled party members finds no support.

Bearing this fact in mind, the leader-Communists of this district's air forces endeavor at all times to be in the thick of things, and this is the correct attitude, for wherever leader personnel have the ability to draw the men into a concerned, frank conversation on what pleases them and what bothers them, wherever practical thinking and good initiative are always supported, a healthy moral atmosphere prevails and combat and political training tasks are successfully accomplished. On the other hand, departures from regulations and breaches of the requirements of military discipline most frequently occur where the commanding officer, the political worker, and other persons in authority do not bother genuinely to examine problems of concern to the men, are unaware of the true state of affairs, and fail to exert proper influence on it.

A fine tradition has long since taken firm root in the Armed Forces: the more difficult the situation and the more complicated the task assigned to the collective, the more aggressively Communists use word and personal example. And this is logical, since a Communist, as was noted at the April (1985) CPSU Central Committee Plenum, is assessed according to his actions and deeds. There are no other criteria, nor could there be. The practically tested and proven principle of judging people not by their words but by the specific results of their labor should be observed in every party organization.

The 27th CPSU Congress placed sharp focus on the question of further increasing the effectiveness of the work done by party organizations. It is the duty of political agencies, party committees and buros, and party activists to make every effort to create in party organizations an atmosphere of mutual demandingness, intolerance toward violators of military discipline and persons guilty of unnecessary relaxation of demands in their work, conceit and arrogance, and abuse of alcohol.

As the facts indicate, however, in some party organizations unwarranted liberalism occurs even in those instances where an individual shames the title of Communist. Apparently people have not yet fully sensed those demands which the party is today placing on its members. For example, a unit party organization failed for quite a long time to take measures against party member Lt Col F. Parygin, who was displaying a negligent attitude toward his duties and who was failing to observe ethical standards of conduct. And it was only following intervention by the district air forces political section that the question of the advisability of this party member continuing to remain in his position was raised.

The arsenal of party organizations contains considerable means of ensuring the vanguard role of Communists, and they all should be utilized more aggressively today. One of them is monitoring and verification of execution. It has long since been noted that verification disciplines people and increases their feeling of responsibility for the assigned task and for carrying out adopted decisions. This is particularly important today, when the times dictate the

need to reorganize work style and focus on the difficult tasks which the party and Soviet people are engaged in accomplishing today. This particularly applies to leader personnel, who are obliged to keep current on all the doings of the outfits they lead, to know their men's mood and attitude, needs and aspirations, to be able to predict the development of events, and to possess a sense of the new.

As we know, a sense of the new is grounded on initiative, an innovative approach to things, an implacable attitude toward sluggishness and routinism, toward unimaginative, predictable pattern and excessive attention to form with consequent detriment to content. For this reason every commander, regardless of level, is called upon persistently to seek methods and techniques of leadership which would ensure accomplishment of the combat and political training schedule and achievement of socialist pledges with optimal end results, without excessive stress and expenditure of manpower and resources.

For many Air-Force officers in our district the concept of sense of the new is inseparable from ensuring a vanguard role for the Communist. Such leader personnel are distinguished by a genuinely innovative approach to accomplishing the tasks facing them. They include officer V. Mikhaylov. The men he led until recently were to complete the process of mastering a complex aircraft. This commander's organizing ability, ingenuity and sharpness, and his ability to inspire others to productive labor were fully manifested in the process of training. With the aid of his deputies, the party and Komsomol organizations, officer V. Mikhaylov introduced a great many new methodological devices, enabled the collective successfully to accomplish their assigned tasks and win a challenge Red Banner of the district's military council according to the performance results of the last training year. V. Mikhaylov has now been promoted to the next higher position.

The activist position of the party member, equated with the term "being out in front," is seen in a businesslike approach to accomplishing the task at hand and the Communist's high-principled attitude toward party duty. It would be incorrect, however, to state that we have solved the problem of personal exemplariness. Unfortunately one still encounters officers who, having achieved a certain level, rest on their laurels, lose their taste for the advanced and progressive, and are transformed into passive executors. The reason for this is a low level of professional competence, which engenders indifference and leads to losses in realization of the individual's creative capabilities, and diminishes a person, which inevitably results in moral and material costs in combat training.

The military council, commanders, political agencies, and party organizations of the district's air forces, proceeding from the demands of the CPSU Central Committee, are waging a continuous campaign against such shortcomings and are concerning themselves with developing in each party member, especially leader personnel, the ability to display intelligent initiative, to take responsibility, and to complete a job once begun.

There is plenty to work on. For example, some leader personnel take their time about moving forward and making adjustments in their practical activities. This leads to a situation where training in the subunits under

their command is conducted without considering the specific features of today's combat, in an excessively simplified environment which makes it possible to win easy victories over the "aggressor." There are still outfits in which people are unable or unwilling to utilize all the capabilities of the training simulators and fail to sense the difference which should be present in the flying of, let us say, a regimental commander and flight commander. Some squadron commanders erroneously are of the opinion that combat readiness is the prerogative of higher headquarters. Such a point of view is frankly harmful. A high degree of combat readiness is the end result of all work performed and a matter of honor for each and every serviceman.

Combat training is an active and purposeful process. One of its directional thrusts is continuous renewal and expansion of the arsenal of scientifically-substantiated, practically-proven forms and methods of training and indoctrinating personnel. One must resolutely combat inefficient utilization of training time and all manifestations of conservatism and sluggishness of thinking.

I recall in connection with this a speech by party member V. Klevtsov at a party meeting. He spoke persuasively and convincingly about the men's achievements in combat flying. What he said made quite an impression. It suggested the idea that one carefully study how each training sortie was utilized in the unit to increase pilots' combat proficiency and what role was played by the party organization to instill in flight personnel a feeling of personal responsibility for the end results of a sortie. It turned out, however, that training effectiveness was not that high in the outfit: not every pilot was producing the expected results in combat flying. There were instances where pilots would bring back unexpended ordnance and would receive low marks on bombing. There also occurred errors of omission in methods, tactics, and psychological preparation of personnel.

The main reason for the deficiencies lay in the fact that the party organization found itself unable rapidly to address new requirements in combat training and to evaluate with greater frankness and firmness the combat pilots' level of proficiency. Nevertheless party member Klevtsov failed to mention these problems. And this was apparently because the people in this outfit had retained the custom of refusing to air dirty linen in public. Can this be called party-minded? The spirit of today demands not self-praise but firm and frank revealing and correction of deficiencies.

The Political Report to the 27th CPSU Congress notes: "No reorganization or turnaround can be accomplished if each and every Communist, especially the leader, fails to grasp the enormous importance of practical actions, which are the only things which can move life forward and increase the efficiency of labor. Rambling talk and discussion at numerous meetings and conferences cannot substitute for organizational work."

Excellent party qualities are developed in Communists in the process of practical work. It is very important to ensure that party organizations carefully analyze the contribution of each Communist toward accomplishing the tasks of combat and political training, strengthening of discipline and establishing an esprit de corps in military collectives, fostering an

understanding of the fact that his way of life and conduct are of great importance for the indoctrination of Air-Force personnel. A Communist is obligated to be a standout.

The party places a Leninist demand on Communists in the military -- always to be first wherever it is dangerous and difficult, where success is decided. Personal example, an inspiring word, self-sacrifice and unselfishness in the struggle for the interests of the people and state, as well as purposefulness are most important conditions for successful performance by each and every party warrior.

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## CRITICAL IMPORTANCE OF COMPETENT AIR TRAFFIC CONTROLLERS STRESSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 6-7

[Article, published under the heading "For a High Degree of Combat Readiness," by Military Pilot 1st Class Col V. Neuchev: "Air Traffic Control Discipline"]

[Text] The task of organizing and conducting flight operations without accidents or mishap-threatening situations has always imposed stringent demands on flight operations officers and persons involved in air traffic control and flight operations support.

As we know, the flight operations officer must have the ability quickly and comprehensively to evaluate the constantly changing air and ground situation and precisely to control the actions of aircrews with the aid of the control and support means and facilities at his disposal, to make competent decisions in an emergency situation and to assist aircrews in emergencies, while at all times rigorously observing flight operations discipline.

Experience indicates that a pilot's psychological fortitude, especially in an emergency situation, depends in large measure on the neuroemotional state of the air traffic controller and his ability to give the correct command in a prompt and timely manner, to support an aircrew with a kind word, to help them analyze a situation and reach a correct decision. The calmness and self-control of the tower controller in turn are affected by the moral-psychological state of aircrews aloft. In other words, the psychological climate of interrelationships in the "pilot-controller" link should be viewed only in a dialectical unity and with the determining role of the latter, his high degree of discipline and initiative.

Sometimes when a pilot gets into difficulty in the air, he becomes nervous and queries the tower more than usual. This sometimes evokes an undesirable response reaction. No matter how difficult the air situation or busy the traffic, however, the tower controller should remain calm and collected, giving assistance in a prompt and timely manner to whoever requires it. A tower controller is under particular stress when it is necessary to give immediate assistance to an aircrew. At these moments the mental and emotional stress is so great that it can lead to loss of composure, confusion, and this in turn can aggravate the situation both in the air and on the ground. On the



other hand, calmness, composure, and a sober assessment of the situation help in making precise decisions.

Once Lt Col A. Zimin had an unplanned abort of takeoff. The fact is that, while observing the aircraft's takeoff roll, flight operations officer Lt Col V. Puzanov noticed an unusual glow to the afterburner flame. He called to the crew over the radio but received no response, since the pilot had failed to note anything suspicious. The tower controller was faced with a choice. Lt Col V. Puzanov later stated that as the aircraft began its takeoff roll he noticed an unexpected change in the flame color. He then heard an unusual sound to the roar of the engines. The aircraft appeared to be about to lift off. What should he do? If the afterburner cuts out, the pilot is not required to abort takeoff, but if there is a drop in rpm, the tower controller is obliged immediately to order the pilot to cut his engines, apply emergency braking, and release his drag chute.... And Puzanov ordered: "Cut afterburner and engines! Hit your brakes!"

The pilot unquestionably experienced considerable emotional stress in this incident. But the tower controller was subjected to equal psychological stress. Nevertheless within seconds he grasped the complicated, conflictive situation and made the only right decision. If he had hesitated for a single instant it is difficult to say what would have happened. Swiftenss of reaction, the ability immediately to shut out all other stimuli, composure, coolness and determination, grounded on strict observance of the requirements of guideline documents, enabled him to prevent a potential accident when time was of the extreme essence.

Naturally any emergency situation threatening flight safety imposes enormous psychological and emotional stresses on the pilot and tower controller. In such a situation it is very important not to act in haste, to be nervous, to issue unwarranted commands, and particularly not to be undisciplined, which can be expressed in failure to act with dispatch and in rudeness in radio communications with the aircraft in question, which negatively affect the psychological stability of an aircrew in a difficult situation.

Once Lt Col A. Teterin, after completing a training sortie in IFR weather, was vectored by the tactical control officer into the area where the procedure turn would be initiated. After being handed off to approach control, the pilot on command commenced his procedure turn. Upon completing it, he had doubts about the reading his ADF was showing, but he failed to inform approach control of this. In addition, he failed to make use of airborne instruments and ground nav aids to determine his precise position, but reported that he was inbound on final. But his aircraft was proceeding away from the field.

The approach controller in turn, failing to observe the aircraft's return on his radar display, cleared the pilot to descend and gave him wrong information. Finally, realizing his mistake, he instructed the pilot to do a 180.

Catching a note of alarm in the controller's voice and believing that he was properly aligned on final, the pilot failed to carry out this instruction.



Only after he was ordered to switch on his distress signal and turn a 180 did the pilot swing back on a heading to the compass locator.

In this incident neither the pilot nor, and particularly, ATC came out smelling like a rose. Instead of helping him, the approach controller placed the pilot in a very difficult predicament due to his uncertainty, nervousness, and ignorance of the situation.

Discipline and a strong atmosphere of trust and respect are important in the psychological interaction between aircrew and air traffic controller. A great deal here depends on preciseness, brevity and clarity of radioed instructions, as well as a kind, calm tone of voice. The fact is that one can determine to some degree a pilot's psychological state by the intonation of his voice. If he views the ATC controller as a senior comrade from whom he has nothing to hide, he will without hesitation communicate his difficulties or doubts, without worrying about a subsequent dressing down, which unfortunately still sometimes occurs.

Sometimes a tower controller will say approximately the following: "Check your final approach; you appear to be coming in short" (naturally the pilot adds throttle), and then: "Now you are going to overshoot your mark." It is superfluous to add that such a statement does not help the pilot but hinders him, aggravates his error, and perhaps even fosters it. It is most often inexperienced controllers who say too much, just prior to landing attempting to tell the pilot in detail how he should be shooting his approach. In such instances pilots joke: "Well, basic training has begun." In actual fact verbosity does nothing but harm, since it takes up excessive radio communications time: some pilots are unable to report completing an important phase of their flight, while others are unable to make contact with the tower or with each other in a group flight. When mikes are continuously keyed, it is only a step away to violation of flight rules and regulations.

In our opinion the main qualities defining the ATC controller should be solid methodological and technical proficiency, discipline, strong will, self-control, especially in an emergency situation when time is of the essence, knowledge of the level of job proficiency and psychological preparedness of crew members, and an endeavor to keep current at all times on what is happening on the ground and in the air. Discipline, and consequently flight safety depends to a considerable degree on this.

Once during night flight operations weather in the terminal area, which was already IFR, began to deteriorate rapidly. Flight operations officer Lt Col V. Yeresko decided to send airborne aircraft to an alternate field, at which weather conditions were satisfactory. He had failed to do one thing, however, as required by regulations: prior to commencement of flight operations he had failed to check that the other field and its tower crew were prepared to receive aircraft. As a result the first aircraft to reach the alternate had to fly several approaches before all approach aids were switched on. We should note at this point that sending aircraft to an alternate field is a decision carrying a good deal of responsibility and requires a certain degree of decisiveness on the part of the flight operations officer. Lieutenant

Colonel Veresko's decision was absolutely correct and was dictated primarily by common sense and a strong feeling of responsibility for flight safety.

A traffic controller is bombarded with an enormous flow of various information, 85 percent of which he perceives visually. And if he is not psychologically or emotionally adapted to sharp fluctuations in external stimuli (stressors), specialists in aviation medicine and psychologists state that an initial alarm reaction can transition to a "resistance phase" and subsequently to an "exhaustion phase." In other words he could lose control over his feelings and actions. This is especially dangerous when a large number of aircraft gather in the terminal area, the aircrews of which are waiting for a competent decision from the ground. Regardless of how much working experience each member of the ATC team has, it is the flight operations officer who bears the full burden of responsibility for safety on the ground and in the air. This means that at any moment he may take over control in any zone, backing up any of his controllers. And for this the ATC team should have close intercoordination, mutual trust and understanding, discipline and efficiency. Every individual who holds a microphone in his hand should be deeply aware of the responsibility he bears for flight safety and should create an atmosphere in which things are not made difficult for controlling and flying.

In connection with this I should like to emphasize that it is very important not to be hasty about radioing instructions; a controller should first make sure he understands the situation in detail. Otherwise there may arise a situation similar to that which occurred at a certain airfield during night flight operations.

In order to clear the active for the next aircraft in the approach sequence, flight operations officer Lt Col V. Zhukov was a bit quick in instructing a pilot ending his landing roll to turn off the active, immediately followed by the order to initiate emergency braking. As a result the aircraft blew the tires on its main gear. Such hasty, faulty actions and unwarranted instructions by the flight operations officer created a hazardous situation on the runway.

As a rule highly-disciplined, experienced commanders of strong will are designated flight operations officers. But they too have their physical and psychological limits. The memory is particularly heavily burdened. One must remember what aircraft are where, at what points or on what route segments, the aircraft sequence to final approach descent or to the outer compass locator, plus a large amount of other diversified information which is not easy to remember. Unfortunately at times nobody pays attention to this. And yet, as experience indicates, it is precisely due to overburdened attention and memory and the inability in a difficult situation to switch off instantly from everything not connected with that situation that some tower controllers make mistakes, display nervousness, and depart from the requirements of flight operations discipline. Even emotional breakdowns occur.

One can state that the quality of air traffic control is directly dependent both on the psychological characteristics of air traffic controllers and their level of job training, demandingness and proficiency. Studies have shown, for

example, that following a single practice session a controller's situation response time is approximately 9 seconds, while more than half of his instructions are incorrect. After four practice sessions response time runs 5-6 seconds, and mistakes do not comprise more than 10 percent of all the instructions he gives.

Many units presently use group training classes with simulation of complex phases of flight operations. Flight personnel and the entire ATC team at their work stations take part in these training sessions. This makes it possible to create a condition approximating actual flight operations. A model of an acute situation with time of the essence evokes a certain emotional reaction on the part of ATC team members and helps develop the essential psychological qualities and control skills.

When preparing for flight operations it is very important that tower personnel observe proper working, resting, and diet conditions, which affect work efficiency. This is particularly noticeable toward the end of a flight operations shift. Of course everybody is tired at the end of a work day: aircrews, technicians, engineers, junior maintenance specialists, and ground operations vehicle drivers. But the members of the ATC team feel particular fatigue: not everybody is capable of working for 6 hours straight under constant emotional stress, while retaining strength of spirit, clarity of mind, and a high degree of efficiency. In connection with this I feel that a minimum number of sorties should be scheduled for the final hour of flight operations, in order to reduce the psychological stress. It is very important to provide conditions for ATC controllers just before a flight operations shift whereby they are not involved with resolving difficult on-duty or off-duty problems, so that their thoughts can be focused on a single thing -- precise performance of their job duties.

Pilots turn their gaze toward the windows of the control tower just before takeoff. When they call the tower, in their mind's eye they see a person holding a microphone and expect accurate, concise, full instructions from him, and at a difficult moment they expect good advice and friendly support, which help one make the correct, and perhaps the only possible decision. The ATC controller's job is difficult and critically important. It demands great attention, especially from the standpoint of professional and psychological training. And the more highly disciplined and better trained for control activities a tower controller is, the higher the quality and greater the safety of flight operations.

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### 13 MARCH LAUNCH OF SOYUZ T-15

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) p 9

[Article by Col V. Gorkov, AVIATSIYA I KOSMONAVTIKA special correspondent, Baykonur: "Destination: 'Peace'"]

[Text] "The launch of the spacecraft Soyuz T-15," summarized the chairman of the State Commission, "is scheduled for 15 hours 33 minutes 7 seconds Moscow time on 13 March 1986. The primary crew will be the following: mission commander -- Twice Hero of the Soviet Union Pilot-Cosmonaut USSR Col Leonid Denisovich Kizim; flight engineer -- Hero of the Soviet Union Pilot-Cosmonaut USSR Comrade Vladimir Alekseyevich Solovyev."

And here we are at the launch site. The first artificial Earth satellite was launched from here 29 years ago, and 4 years later the world's first cosmonaut, Yuriy Alekseyevich Gagarin. Today is also a special day. The sun peeped out this morning, signaling an end to the rapidly-changing weather of the last few days. I thought to myself: "This is a good omen." And I recalled Kizim's favorite saying: "We are not superstitious, but we shall not move in haste."

The faces of the scientists, design engineers and specialist personnel assembled at the observation post are anxious. The 27th CPSU Congress has just ended, and all of them naturally feel a strong sense of responsibility for the outcome of the first manned mission following the party forum. I recalled meetings with the crew last month at Zvezdnyy Gorodok. The cosmonauts' training schedule was so packed that we did not get a real opportunity to talk until late in the evening. The training schedule work volume is unusually large and, as always, there is not enough time. Perhaps it is for this reason that one of the newsmen asked the mission commander at a press conference at the Cosmonaut Hotel: "What haven't you yet had time to do?"

"Get enough sleep!"

"What is your favorite song?"

"Earth in the viewing port, Earth in the viewing port..." Leonid Denisovich sang softly and, after a moment of silence, added: "We are also working for the sake of life on Earth."

And in fact, our planet continues to remain the principal focus of Soviet space exploration. Year by year its study from space is producing more and more benefit to the economy and is promoting knowledge and practical utilization of the forces and laws of nature for the benefit of the working man, for the benefit of peace on Earth.

..."Key to launch!" the launch director's command interrupted my musings. It is hard to become accustomed to these always nervous seconds, and it is even more difficult to convey the feeling generated by the engine ignition and the rising roar of the rocket engine. Bon voyage, "Beacons"!

Their first "stop" was 2 days later. Its name -- the Mir [Peace] station.

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## WORLD WAR II EXPERIENCE IN AIR OFFENSIVE AGAINST ENEMY RESERVES

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 10-11

[Article, published under the heading "Experience Born in Combat," by Col Ye. Tomilin: "Combat Against Enemy Reserves"]

[Text] Operations conducted by the Soviet Air Force during the first months of the Great Patriotic War immediately raised the question of finding effective forms and modes of combat against enemy reserves by Soviet air forces. The scale of enemy troop redeployments and preparations for counterthrusts were of determining significance. If a redeployment of fascist forces took on operational-strategic significance, the Soviet command authorities would mount special air operations. But most frequently air forces would deliver strikes on reserves within the framework of front offensive operations in the form of daily combat operations. The first air operations to destroy large enemy force groupings and to disrupt maneuver of enemy reserves were conducted in August-September 1941.

In mid-August the Hitlerite command authorities tasked the 2nd Panzer Group and the 2nd Field Army from Army Group Center with encircling the forces of the Southwestern Front, which were defending in the Kiev area. Possessing an overwhelming numerical superiority, the enemy broke through the Soviet forces' defense. Enemy panzer and motorized units proceeded to advance in the direction of Mogilev, Gomel, Roslavl, and Starodub. Headquarters, Supreme High Command [Hq SHC] made the decision to mount an air operation to destroy the forces of the 2nd Panzer Group.

The air forces of the Bryansk and Reserve fronts, a portion of long-range bomber forces, and the 1st Reserve Air Group -- a total of 450 aircraft -- took part in the operation. According to the plan of operations, large forces of bombers and ground-attack aircraft, under fighter escort, were to hit tank columns proceeding along the roads. In order to apply continuous pressure on the enemy, the long-range bombers were assigned the mission of flying night strikes. Approving the air operation plan, the Supreme Commander stressed: "The enemy's columns must be hit continuously, wave after wave, all day from morning to nightfall."

From 29 August through 3 September Soviet aircraft flew strikes on Hitlerite panzer and motorized units in the Unecha, Starodub, and Novgorod-Severskiy area, a total of more than 4,000 sorties. As a result the enemy sustained considerable casualties and equipment losses. The rate of advance of the Fascists' 2nd Panzer Group decreased somewhat.

Nevertheless, although the air operations were producing rather good results, the objectives of the air operation were not fully attained. This was due first of all to the fact that there were insufficient air forces available, secondly, that there was a shortage of flight personnel trained to fly night combat missions and, thirdly, that our air activities were negatively affected by adverse weather conditions (the weather restricted flying on 19 and 31 August and on 3 September).

Soviet air forces operated with greater success against enemy reserves in the offensive operations of the second and third period of the Great Patriotic War. This mission was performed in a more purposeful manner as the Pe-2, Tu-2, Il-4, Pe-8, Il-2, and Il-10 became operational.

On 3 August 1943, during the Battle of Kursk, the forces of the Voronezh and Steppe fronts split the enemy force in the Kharkov area and put it in jeopardy of total annihilation. To restore the situation the Hitlerite command authorities proceeded to move 10 divisions from other sectors of the Soviet-German front. By decision of Hq SHC, an air operation was conducted from 4 to 12 August to thwart the advance of enemy reserves. The 8th, 17th, 5th, and 2nd Air armies as well as long-range bombers took part in this operation. The first to hit the panzer and motorized divisions which were moving out from the Donbass were bomber and ground-attack combined units of the 8th Air Army of the Southern Front. They flew a total of 1,867 sorties. Subsequently aviation combined units and units of the 17th Air Army of the Southwestern Front swung into action. They flew 4,113 sorties from 4 through 12 August. On 4 and 5 August alone the men of these air armies smashed 16 trains and destroyed 28 tanks and more than 300 trucks on the road.

The 5th and 2nd Air armies of the Steppe and Voronezh fronts commenced combat operations against enemy reserves on 8 August. Strikes were flown chiefly against panzer and motorized columns on highways.

This operation continued 10 days. Soviet pilots flew more than 7,100 sorties. Hitlerite panzer and mechanized divisions were unable simultaneously to mass in the Akhtyrka and Bogodukhov areas and to operate against our forces in coordinated fashion, which made it much easier for the Voronezh Front to accomplish the task of repulsing counterthrusts and achieving final defeat of enemy forces in these areas.

In June 1944, during the Belorussian Strategic Offensive Operation, the Hitlerite command authorities began hastily redeploying large forces of reserves into the Vitebsk, Bobruysk, and Minsk areas. A total of 15 divisions and 2 brigades arrived in Belorussia between 25 June and 16 July. Under the circumstances the Soviet command authorities decided to conduct a large-scale air operation to thwart the advance of enemy operational reserves. Eight long-range bomber corps were designated to take part in the operation. It

pursued the aim of disorganizing orderly rail movements and making it more difficult for enemy reserves to move up in an area 700 kilometers wide, extending from Daugavpils to Ivov.

Between 4 and 12 July Long-Range Aviation combined units flew more than 2,600 night sorties against rail centers, railyards, and traffic out on the line. As a result of airstrikes, and aggressive actions by partisan combined units and units behind enemy lines, rail traffic in Belorussia was disrupted to a considerable extent and reserves sustained heavy losses and arrived at their destination far behind schedule and considerably weakened. Strike results attest to the effectiveness of the air operations. For example, a railway station and locomotive depot were demolished, 9 locomotives and a bridge across the Mukhovets River were put out of operation, 30 trains carrying equipment, ammunition and troops were burned, and a division headquarters was destroyed as a result of night airstrikes on the Brest rail center on 7 and 8 July. During the Belorussian Operation long-range bombers hit 28 rail junctions and yards, flying 9,500 sorties.

Successful Soviet air operations against enemy reserves in the western strategic sector in the summer of 1944 helped accomplish defeat of the Wehrmacht's main force grouping -- Army Group Center -- and liberation of the Belorussian people from Fascist enslavement.

At the same time we should note that Hitlerite rail traffic was not entirely stopped in the course of the air operation. This was due to the fact that the short summer nights prevented us from keeping the enemy's rail lines of communication under continuous air attack during an extended period of time. Bombers operated on a limited basis during daylight, and the enemy was able to repair damage. In addition, the young aircrews were not fully trained for night combat operations and had not worked sufficiently on illuminating targets during delivery of airstrikes.

Virtually all air components took part in combat operations against enemy forces on lines of communication. In order to increase the effectiveness of airstrikes on small, mobile targets, in its order dated 4 May 1943 Hq SHC instructed the commanding general of Soviet Army Air Forces to organize a ground-attack and a fighter regiment in each air army, which would specialize in knocking out trains, locomotives, tank cars, truck convoys, and individual trucks. This decision proved fully warranted, which is indicated by the results of air combat operations in the Belgorod-Kharkov, Zhitomir-Berdichev, Korsun-Shevchenkivskiy, Iasi-Kishinev, Belorussian, Lvov-Sandomierz, Vistula-Oder, Berlin, and other operations.

In the course of the 1944 Korsun-Shevchenkivskiy Operation, for example, the enemy was readying to mount powerful counterthrusts against the forces of the 5th Tank, 4th Guards, and 53rd armies with the objective of breaking out an encircled enemy force. Air reconnaissance spotted an enemy panzer force in the Shpola area. The commanding general of the 5th Air Army assigned the 1st Guards Ground-Attack Aviation Division the mission of hitting this panzer force. Particularly intensive air combat operations were conducted between 29 January and 3 February. In spite of the numerical superiority of the Hitlerite air forces, Soviet pilots flew more than 2,800 sorties. Fighters



fought 120 air engagements and downed 130 aircraft. The enemy failed in his attempts to break out the encircled force.

In the second phase of the Vistula-Oder Offensive Operation the pilots of the 16th Air Army of the First Belorussian Front very successfully engaged enemy reserves. When Soviet forces broke through the Hitlerites' defense (12-17 January 1945), the fascist command authorities proceeded hastily redeploying into this area reinforcements from the Western and other sectors of the Soviet-German front. The front's command authorities, however, took measures to destroy the enemy reserves piecemeal. Aerial reconnaissance pilots spotted the Grossdeutschland Panzer Corps, for example, redeployed from East Prussia, as it was offloading in the Lodz area. Thanks to joint actions by Soviet pilots and tankers, this corps never made it into battle. This enabled Soviet forces to reach the Zychlin-Lodz-Radomsko rear line of defensive positions ahead of the arrival of units of the Hitlerite panzer corps and to penetrate past this line without a pause.

The second and third period of the Great Patriotic War were characterized by a considerable expansion of scale of employment of air against enemy reserves and to thwart enemy redeployments. In the first period of the war the Soviet Air Force flew approximately 22,800 sorties involving this mission, and more than 38,700 and approximately 39,300 respectively in the second and third periods of the war. This helped increase the scope and scale of offensive operations of the Soviet Armed Forces.

Generally frontal aviation and long-range aviation units would engage enemy reserves upon completion of penetration of the tactical zone of defense. Since troops were moved primarily by rail, the principal targets for airstrikes were rail interchanges and railyards as well as trains out on the line.

Practical experience in employment of air forces indicates that the average rail junctions and interchanges, generally covering an area measuring 400 by 1,100 meters, possessed a high degree of survivability and could be rapidly repaired. One such facility could be knocked out by a force of 170 bombers, each carrying 1,000 kilograms of bombs. In addition, in destroying enemy reserves it was necessary to hit specific targets. This required skilled selection of modes of delivering strikes and effective tactical devices. Evolution of modes of air combat operations proceeded in the direction of increasing the size of strikeforces. Concentrated airstrikes were extensively employed in the final operations of the war, especially in the Berlin Operation.

Aircrews of the 2nd Air Army successfully accomplished the mission of thwarting organized enemy counterthrusts against the 3rd and 4th Guards Tank armies from the Cottbus and Spremberg areas in April 1945. Seventy-five percent of the air army's forces were assigned to provide air support to the tank crews. Ground-attack aircraft continuously hit enemy weapons, counterattacking tanks and troops. Bomber efforts were also directed at hitting reserves deep in the defense. 150 bombers flew concentrated airstrikes on tanks in the enemy's third defensive zone in the Cottbus, Spremberg, and other fortified areas. As a result advance, commitment to

action, and counterthrust by enemy forces were disorganized on the whole. Regiment and division-size strikes on several targets specified in advance and at a designated time created conditions for achieving the operation objectives.

The command authorities and staffs of air armies, combined units and units skillfully combined concentrated strikes with offensive actions in waves by regiments, squadrons, flights, detachments, and two-aircraft elements. Strikes would be flown against previously-assigned targets or targets spotted in the course of combat operations, at a designated time as well as on request from a ground alert status. This ensured constant, continuous pressure on the enemy. In the 1943 counteroffensive at Kursk, for example, continuous waves of strikes by regiment and squadron-size forces against the Bryansk, Orel, Karachev, Gomel, Unecha, Roslavl, Belgorod, Kharkov, Poltava, Krasnograd and other rail centers virtually deprived the fascists of the capability to move troops up to the front. Actions by forces of 3-9 aircraft became widely employed at that time. Bombing altitude against weak antiaircraft defense ranged between 800 and 2,000 meters, and 3,000-5,000 meters with strong antiaircraft defense. Each aircrew would aim on its target independently, and bomb release would be from level flight.

Independent search in an assigned area was employed in all air components in conditions of air supremacy. Small groups and even single aircraft would fly missions. This method was employed at night in long-range aviation.

The tactics of the various air components in delivering bombing and ground-attack strikes on linear, small and mobile targets were simultaneously improving. Experience indicated that with weak fighter escort and strong enemy air defense, airstrikes by regiment-size forces from altitudes of 2,000-3,000 meters were little effective, especially on tank and motorized-mechanized columns. Therefore bombers and ground-attack aircraft shifted to flying strikes in small elements of 3-5 aircraft at altitudes of 600-1,000 meters, employing a formation of aircraft in trail.

Tactics employed to penetrate air defense were also constantly improving. Altitude-stacked strike and diversionary groups were incorporated in the combat formation. To gain the element of surprise, strike aircraft would approach the target in a shallow dive with throttled-back engines and from different directions.

Analysis of air combat operations against reserves, redeployments, and repelling enemy counterthrusts indicated that good results were achieved if strikes on lines of communication were delivered throughout the entire maneuver area. Bombing rail targets close to the battle line would not thwart maneuver and redeployment of forces, since motor transport movements could easily replace rail movements. Organization of efforts combating redeployment of troops required continuous observation of the movement of units and analysis of weak points in the enemy's system of lines of communication.

Operational air reconnaissance was conducted to a depth of 150-300 km, with tactical air reconnaissance conducted to a depth of 100 km. This made it possible to detect redeployment and advance (approach) of reserves as well as

the axes of planned counterattacks, which unquestionably was helpful to the Soviet command authorities in estimating the situation and making decisions for subsequent actions in operations. At the same time frontal-aviation aircraft currently in service could not provide air reconnaissance and simultaneous strike delivery deep behind enemy lines. In some instances information about spotted reserves would be delayed in reaching headquarters. Experience in planning and scheduling air reconnaissance indicated that in order to ensure advance and complete discovery of the enemy's intentions, air reconnaissance should be organized to a depth of 400-600 km or more. As troops advanced, the depth of surveillance tracking of these troops should be increased, as should intensity of reconnaissance effort.

Practical experience in delivering strikes on mobile or moving targets indicated that maximum effectiveness was achieved when motorized-mechanized and panzer columns were moving on forest and unpaved roads as well as at a river-crossing site. High explosive and fragmentation bombs as well as incendiary mixtures produced the greatest effect, especially in conditions of forested terrain.

Coordination between long-range aviation combined units and air armies consisted in distribution of zones of responsibility. Strikes on targets situated 200-300 kilometers or more from the battle line would be delivered by heavy bombers, while frontal aviation would hit targets in the combat zone (up to 150-200 km from the forward edge of the battle area). Operations (especially in the Belorussian Operation) would be coordinated with headquarters of partisan combined units and units. Air-forces control would be exercised in a centralized manner by that authority which organized the strike.

Air-force combat operations to destroy enemy reserves and disrupt the enemy's lines of communication were a component part of large strategic (front) offensive operations and were conducted on axes of major importance. They helped accomplish rapid crushing defeat of large Wehrmacht force groupings and created conditions for offensive exploitation by Soviet forces to considerable depth.

Frontal and long-range aviation flew a total of 168,000 sorties against reserves and enemy lines of communication during the years of the Great Patriotic War, comprising 5.4 percent of the total number of sorties flown. Long-range aviation alone expended on such strikes 37 percent of the total weight of the bombs it delivered during the war years.

In conditions of rapid development of all modes of transportation, especially air and sea, capable of rapidly transporting large numbers of troops considerable distances, the experience of employment of the Air Force against enemy reserves during the Great Patriotic War assumes increasing significance in operational-tactical and combat training of troops, commanders, and Air-Force staffs.

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## FLYING YAK-36 FORGERS FROM ASW CRUISER "MINSK"

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 12-14

[Article, published under the heading "About Delegates to the 27th CPSU Congress," by Col Ye. Besschetnov: "Vertical Climb"]

[Text] Military Pilot 1st Class Col Yu. Churilov, commander of an aviation regiment of the Red-Banner Pacific Fleet, was a delegate to the 27th CPSU Congress. A member of the postwar generation of Soviet pilots, he received his commission only 15 years ago. But the success he has achieved during these years! When he transferred over to Naval Aviation, Churilov, a product of the Air Force, mastered the VTOL aircraft to perfection, has made an appreciable contribution to accomplishment of the missions assigned to his unit on extended sea and ocean cruises, and has trained a great many embarked-aircraft naval aviators. The military labor of this officer-Communist has been duly rewarded -- by ukase of the Presidium of the USSR Supreme Soviet, Yuriy Ivanovich Churilov has been awarded the title Hero of the Soviet Union.

The cruiser "Minsk," at sea on a training cruise, was knifing across the ocean deep. Churilov was in the ready-room lounge with the other pilots when the command to launch came. Broad-shouldered and husky, Yuriy Ivanovich looked something like a cosmonaut in his orange flying suit. Leaving the lounge, he strode firmly across the cruiser deck toward his aircraft. Climbing into the cockpit up a ladder held by the crew chief, he settled into his seat and proceeded to turn on toggle switches. The roar of the turbines rose in a crescendo. A flame lashed explosively out under the aircraft's belly. The roar of the engines rose to such a high note that it seemed as if a mysterious force was tearing an unyielding piece of canvas into shreds. Lifting off the deck, the aircraft hovered for several seconds at superstructure height, and then proceeded to shoot forward, rapidly accelerating.

Yuriy Ivanovich figured that this would be a routine training flight out over the ocean, as the flight schedule had stated. But after he had taken off he realized that he had launched early for a reason. Executing a turn and

passing over the deck while maintaining level flight, he heard in his headset: "Bogies picked up by radar...."

"Roger," Churilov replied and, carrying out the GCI officer's instructions, headed toward the target.

Yuriy Ivanovich knew that the air surveillance team, which had swung into action, would be closely tracking the development of events. But nevertheless things depended primarily on him, on his volition, tenacity, and skill.

Stretching out below were the white-capped waves of the restless ocean, and above him the sky was dotted with a few scattered cumulus. Where was the target? Churilov soon spotted a pair of "bandits" heading in the direction of the cruiser. Brightly illuminated by the noonday sun, they stood out as whitish dots against the violet background of the ocean. Yuriy Ivanovich, who was at a higher altitude, immediately pushed the control stick forward, banking right and descending to an intercept point. The pilot became increasingly seized by the excitement of combat.

After angling away from the pair, now off his starboard wing, he turned to a parallel heading. He could see identifying markings on the swept wings, narrowing toward the wingtips, of the reconnaissance aircraft, equipped with the latest photoreconnaissance and electronic intelligence-gathering gear. Churilov rocked his wings several times, banking right, which meant: "Alter your heading!"

The leader swung abruptly to the right and headed away, followed by his wingman. "It's about time!" Yuriy Ivanovich commented to himself. He following the reconnaissance aircraft until they had completed turning back 180 degrees and were proceeding out of the area. After another 5 minutes airborne, he received clearance to land.

Such "encounters" are no rarity for Col Yu. Churilov and his men. Nevertheless each encounter is subjected to a detailed analysis. After returning to the deck of the cruiser, Yuriy Ivanovich assembled the pilots, related the air "incident" in detail, shared his knowledge and experience, and shared counsel and advice, for it is important that every last pilot is prepared to display calmness, self-control, and composure in the skies over the ocean expanses and has the ability to defend our interests, honor and dignity.

...I met Yuriy Ivanovich shortly before the opening of the 27th CPSU Congress. There stood before me an officer of modest stature, broad-shouldered and round of face, wearing a naval uniform with a Gold Star and two rows of ribbons on his uniform jacket.

Yuriy Ivanovich told me about himself, the difficult job of an embarked-aircraft pilot, and about his work as a leader of others; there took shape before me the splendid image of a modern Soviet officer, a pilot for whom the interests of the homeland are above all else. For several years now Churilov has been a ranking officer, and his name is known throughout the country. And yet he has been in the service only since 1969. Did he have any inkling at

the time about the heights he was destined to reach? Very likely not. One can even say that he got into flying by accident. But there was evidently a certain mechanism at work in that chance occurrence, grounded upon his aspiration and striving to find his niche in life, fully to develop his considerable abilities, and to dedicate himself to a great and noble cause -- serving the people and the homeland.

Yuriy spent his childhood and youth in Voronezh Oblast, in the village of Slastenovka. He was born there four years after the Great Patriotic War. It was here he grew up, received his upbringing, went to school, and learned the first lessons of life. What should he become? He did not give any particular thought to this question. And although it happened that his birthday coincided with Soviet Army and Navy Day, Yuriy did not consider this to be any kind of omen. He was drawn more to the land, to the kolkhoz fields, to the broad fields of grain. During his vacations he liked working in the fields and was interested in machinery. Whenever they would be repairing a truck, tractor, or combine, he would be right there. He would watch, observe, and give the grownups whatever help he could.

It was perhaps his love of machinery, which grew stronger with the passing years, which preordained his initial choice. After completing secondary school, he applied to the Voronezh Polytechnic Institute. In spite of the fact that he received high marks on the examinations, however, he failed to make it through the competitive selection process -- he was 1 point short. This naturally was a great disappointment, but this setback did not dampen his ardor. He decided: "No problem. I'll work for a year, prepare myself better, and then enroll!" In the meantime he took a job at the Voronezh Aircraft Plant as an instrument adjuster.

He developed a great love and enthusiasm for aviation. A year later he enrolled in the DOSAAF flying club. He continued working at the plant, but in the evenings, after work, he would head off to training classes. He worked diligently on mastering theory the entire following autumn and winter, and in March he and other student pilots began going up in an I-29 trainer.

He had a great many friends. He became particularly good friends with Tikhon Arkatov. They would often talk about the future. They would complete training at the flying club, but what then? They wanted to master a more complex aircraft, such as the MiG-17 fighter. The club officials helped them transfer into the Kaluga DOSAAF flying club, where that aircraft was being studied.

When they completed training, they were again faced with a choice: what direction should they take? The knowledge they had acquired could be applied in civil aviation, or they could choose a career in the military. The latter seemed attractive, and both decided to become military pilots. The entire following year they devoted to preparing to take the entrance exams for military aviation school for pilots. And they achieved their goal. Years of training went by. Upon completing school, in November 1970 Yuriy Churilov and Tikhon Arkatov were assigned to an Air-Force fighter-bomber regiment in the Carpathian Military District.

The aircraft in service with their unit was the MiG-17, which was inferior to the more potent combat aircraft being flown by other subunits. But Churilov liked flying this dependable, easy-to-fly fighter, with which he was thoroughly familiar. In addition, he was of the opinion that one can display genuine expertise even on such an aircraft as the MiG-17 if one had the desire. He prepared thoroughly for every training sortie to the practice area or to the bombing and gunnery range, working persistently to hone his skills in VFR and IFR weather. During tactical air exercises they would be called upon to deploy to other airfields in their own district or in a neighboring district and to work on ordnance delivery techniques at unfamiliar ranges. Regardless of how much the tactical situation changed at times, Yuriy Ivanovich usually received nothing but marks of good and excellent on his training sorties.

Churilov passed the proficiency rating tests at the appropriate time, improved his rating another level the following year, and 2 years later earned first class. In his 5 years of service in the aviation regiment he rose from rank-and-file pilot to flight commander and from lieutenant to captain.

Once he was summoned by his commanding officer. He was told that a well-trained pilot was needed for the position of squadron deputy commander of a naval aviation regiment.

"As I recall, didn't you express the desire to transfer to naval aviation? You have an opportunity. We consider you to be the most suitable candidate...."

"But what about Arkatov? We wanted to serve together...."

"Unfortunately there is only one slot."

It was apparent that he and Tikhon would be going their separate ways.

At his new duty station Yuriy Ivanovich reported to regimental commander Major Svyatochev. Vyacheslav Mikhaylovich firmly shook the new arrival's hand: "I am very happy to see you. There is a lot of work to be done, and at present we are short of personnel."

He immediately introduced him to the officer in charge of air, weapons, and tactical training, Capt Vasiliy Ivanovich Yurov, and his deputy, Maj Vladimir Aleksandrovich Kurilov.

"Additional officers will be reporting for duty, but it is time for us to get started," stated the regimental commander.

He would be flying a VTOL aircraft. When Yuriy Ivanovich got a look at this aircraft, he could not conceal his delight. He had heard so much about it! Outstanding Soviet pilot Hero of the Soviet Union and Honored Test Pilot USSR Yuriy Garnayev had been involved in the aircraft's early development. Many other test pilots -- factory and military -- had put their heart and soul into this aircraft. Oleg Kononenko, Mikhail Deksbakh, Valentin Nazaryan, Vladimir Gordiyenko.... It had taken years of persisting labor on the part of



scientists, designers, engineers, and intrepid work by test pilots to perfect this aircraft. In August 1967 Hero of the Soviet Union Valentin Mukhin had put on a flight demonstration of a test model of a VTOL aircraft at the Domodedovo air show. Now the aircraft had entered operational service, and he, Churilov, would be mastering this intelligent, complex and nimble machine.

Yuriy Ivanovich worked so diligently that within 4 months he not only displayed brilliant knowledge of what was for him a new aircraft and the peculiarities of flying it, but also proceeded to go up on training flights.

That fall a large group of young pilots, graduates of the Chernigov Higher Military Aviation School for Pilots, was assigned to the regiment. Several of them were assigned to Churilov, who was already in command of a squadron and had been promoted to the rank of major. Lts Aleksandr Desyatnikov, Nikolay Khapoknysh, Viktor Nefedov, Valeriy Perepechko, and others made a good impression on him.

The roar of jet engines continued unabated from morning to evening at the airfield -- intensive flight training was in progress. Squadron commander Churilov took up in the trainer both the novice pilots and those who had joined the outfit earlier. Takeoff, pattern work, and landing -- everything which had been practiced in advance on the simulator -- were now being honed to perfection with the actual aircraft. It was important not only to teach the pilots correct procedures but also to instill faith in the aircraft and to develop and reinforce combat-pilot qualities.

That exciting day finally arrived, when the cruiser "Minsk," having taken VTOL aircraft on board, put to sea on its first long cruise.

They were cruising in the Mediterranean when the pilots first came face to face with Americans. A 2-aircraft element was launched from the deck of a U.S. aircraft carrier looming on the horizon and brazenly inspected the Soviet ASW ship, as if they could not believe that they would now be forced to share the ocean expanses. It was then that Yuriy Ivanovich perhaps for the first time truly acutely and profoundly sensed and perceived the wisdom and perspicacity of the decision to equip our fleet with embarked aircraft. And what a great responsibility would henceforth be borne by the VTOL pilots, for whom this mighty cruiser had been built!

The cruise continued, as did the combat training and psychological reorientation of the naval aviators, for VTOL aircraft required, one might say, the forming of a new type of pilot, who possesses enormous personal courage and daring.

"At sea a person feels totally different," Yuriy Ivanovich explained. "When you are flying over familiar terrain you always sort of know that solid ground is right there under you, and this inspires calmness and confidence, while when flying above the sea your only landing spot is the cruiser's deck. The awareness of constant danger adds psychological tension. And cruises are quite long. Separation from one's native shores, one's home and family, and the specific burdens of sea duty all have an effect on a pilot's psychological mood. The difficulties are experienced for the most part at first, it is



true. When you get drawn into the busy rhythm of duty at sea, when work begins, all extraneous thoughts and concerns recede into the background, as it were."

He recalled how he had brought along and developed the regiment's pilots, instilling in them qualities essential to a navy man and a combat pilot. And he was quite pleased with his charges. Aleksandr Desyatnikov has become a major, a regimental deputy commander for flight training, and has now enrolled at the academy. Viktor Nefedov and Valeriy Perepechko are also now majors, both lead squadrons and are themselves teaching others. Many of his pupils from the early days of Soviet shipborne aviation are now doing a fine job of carrying on the traditions which were laid down at that time.

"A high degree of professional skill forms the primary basis of solid combat-pilot qualities," said Yuriy Ivanovich. "No matter how well trained a pilot in the regiment may be, we have a firm rule -- we regularly check his proficiency level, regardless of his position and length of service in embarked aviation."

...Col Yu. Churilov went up with squadron executive officer Capt V. Petrusha in a trainer to check his flying technique. Petrusha did a precision, confident job of executing the vertical takeoff, flying the pattern around the ship, and now, having made his final turn, was heading in on final. The cruiser's dark silhouette, softened by the mist, loomed in the distance. The pilot reported on final to the flight operations officer, who replied: "Cleared to land!"

Yuriy Ivanovich, in the instructor's seat, closely watched the captain's procedures. Petrusha was performing flawlessly.

The markings on the deck of the cruiser, which was steaming ahead at dead slow, grew closer. The cushion of flame under the aircraft was compressing, becoming thinner and thinner. The wheels touched down, followed by a light jolt.... That was it! The aircraft was in 3-point contact, "grasping" the flight deck.

What should he say to Petrusha at the critique session? In general he had flown brilliantly. Nevertheless the regimental commander did have something to talk about. He had no adverse comments to make about the officer, but Petrusha was himself an instructor, and it was important for him to know where to focus attention when checking the squadron pilots' flying technique. Yuriy Ivanovich held a brief analysis session in the ready-room lounge. He stated which procedures he had particularly closely monitored and how Petrusha should proceed in the future, relying on his experience. And although what Colonel Churilov told the pilot was nothing new to him, the captain listened attentively to his commanding officer, for the comments and advice were permeated with concern for increasing his professional skill -- both as a pilot and as an instructor.

Yuriy Ivanovich has a sensitive, attentive, caring attitude toward each of the regiment's pilots. Everyone who serves under him he taught to fly this

unusual aircraft; he endeavored to instill faith in the aircraft in each and every pilot, and with each and every one he shared his wealth of experience.

Churilov relies extensively on leader-Communists and party activists in his multifaceted, busy activities as a commanding officer. His deputies -- Majs Ye. Matveyev, V. Krasovskiy, and V. Baluk -- as well as squadron commanders Majs V. Nefedov and V. Perepechko, plus others, help him a great deal in accomplishing his diversified and complex tasks.

Col Yu. Churilov is a member of the first generation of Soviet embarked-aircraft pilots. He was among the first to fly from shore and deck, to perform the full-power vertical takeoff during daylight and at night, to go on long sea and ocean cruises, and to pass on his amassed experience and know-how to others. A delegate to the 27th CPSU Congress, this famed pilot is teaching the men of his regiment to assess the results of their labor through the prism of the ideas of this highest forum of our country's Communists and to increase their vigilance and combat readiness. Under his guidance, the regiment's aviators are efficiently standing ocean watch, taking off from the deck of a cruiser, expanding and increasing its defensive power out in the expanses of the World Ocean....

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## EFFICIENT TRAINING DEVICE FOR HELICOPTER CREW ARTILLERY SPOTTING, ADJUSTMENT OF FIRE

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[Article, published under the heading "Engendered by Innovative Thinking," by Col V. Kurochkin and Candidate of Military Sciences Col G. Vypiraylenko: "Increasing Effectiveness of Adjustment of Fire"]

[Text] The fast-moving and highly-dynamic nature of modern combat imposes stringent demands on quality of training helicopter crews to observe and adjust artillery fire.

We should note that the time difference between actual artillery fire and artillery shellburst simulator (ShIRAS) detonations is quite considerable and runs 3-4 minutes during daylight and 6-7 minutes or more at night. This naturally diminishes the effectiveness of training aircrews to operate in a combat environment and requires considerable time in the air. There are also other factors which affect the quality of aircrew training.

In order to increase the efficiency of training aircrews in artillery fire observation and adjustment, we propose an area (range) setup variation measuring 500 x 500 meters, with automated control. At the center of this area is a target mock-up with a simulator detonation control cab and VHF/UHF radio (Figure 1). Buttons with electrical connector numbers and digital lamps indicating the number of unexpended simulator devices (IS) on a given electrical connector are positioned on the control panel in conformity with the situation in the target area (Figure 2). A microcomputer provides capability to compare the actual location of simulator detonation with the coordinates obtained from the helicopter crew, to determine errors, and to calculate the next simulated burst location figuring in the pilot's adjustment error.

The method of training aircrews to perform adjustment of artillery fire consists in the following. After determining target coordinates and transmitting them by radio to the range air operations officer (RP), the helicopter crew waits for "battery" readiness to fire, flying in a specified pattern. Upon receiving a signal from the helicopter, the range officer replies: "Round fired" -- and detonates the simulator by pushing the appropriate button, initially at maximum distance from the target. Having

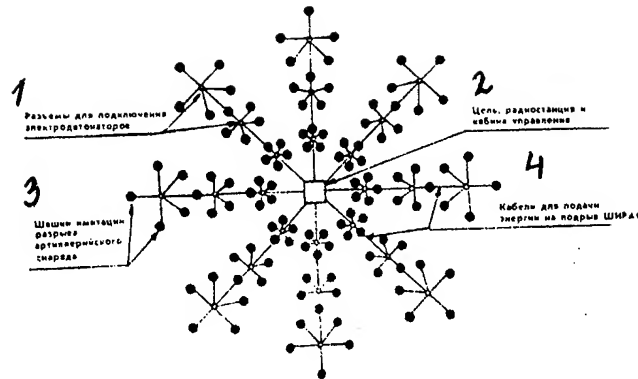


Figure 1. Diagram of range layout.

Key: 1. Connectors for electric detonators; 2. Target, radio, and control cab; 3. Shellburst simulators; 4. Shellburst simulator detonation cables

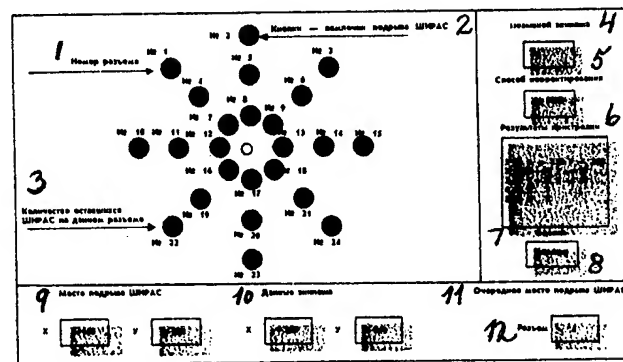


Figure 2. Shellburst simulator detonation control panel

Key: 1. Connector number; 2. Shellburst simulator detonation buttons-lights; 3. Number of remaining shellburst simulators on a given connector; 4. Aircraft callsign; 5. Method of adjustment; 6. Adjustment results; 7. Mark; 8. Good; 9. Location of shellburst simulator detonation; 10. Data provided by aircrews; 11. Next location of shellburst simulator detonation; 12. Connector

determined the "shell" burst location, the helicopter crew transmits the coordinates to the range officer who, using a computer or graphs, finds the error in determining burst location and, taking this error into account, determines the location of the next "shellburst." The helicopter crew makes

error adjustment increments of 15-50 meters (depending on distance, observation altitude, and time of day).

Employment of the proposed range layout has made it possible to reduce time between simulator detonations to 30-40 seconds, which is 5-8 times shorter than with the existing method. This will substantially increase efficiency of training: an aircrew makes 3-4 times as many corrections in a single sortie, and the number of pilot (aircrew) training flights decreases by a factor of 2-3. The projected savings for a separate helicopter squadron is approximately 90 hours of time in the air per year.

Increasing the accuracy of determining a helicopter crew's error in pinpointing the location of a simulator burst makes it possible in turn to shorten adjustment of fire training time and more objectively to grade aircrew performance. Employment of remote detonation of shellburst simulators greatly increases safety for the range crew.

The proposed method will make it possible to increase accuracy of corrections and reduce target locating time. With a weakened "enemy" air defense system, for example, adjustment of artillery fire can be carried out a distance of up to 3-4 kilometers from the "battle line." Time required by a helicopter crew to spot a target in VFR weather decreases considerably.

In our opinion employment of well thought-out grading standards will make it possible more objectively to approach determination of the level of a crew's proficiency in observation and adjustment of artillery fire at minimum observation distances to the target and shellbursts.

Practical work on field training assignments by aircrews at our school is preceded by flight personnel training in the classroom and on the simulators. Training classes employ tabletop terrain models with the tactical environment and radio-equipped work stations, a VCR with a recording of a film segment or battle event, or delivery of an artillery strike. Illuminated models are employed for acquiring skills in artillery fire observation and adjustment at night, as well as projection of slides for a time corresponding to the operating time of target illumination devices.

Other scenario elements are also worked with, which cover the various conditions of combat operations which can affect the quality of accomplishment of the artillery fire observation and adjustment mission. This enables students to acquire good skills in accomplishing particular ground-troops support missions.

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## EXAMINATION OF STRUCTURE, AUTHORITY OF PARTY IN ARMED FORCES

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 28-29

[Article, published under the heading "27th CPSU Congress: Aspects of Theory and Practice," by Professor and Doctor of Historical Sciences Col F. Seyranyan and Docent and Candidate of Historical Sciences Col Yu. Topchiy: "Party Organizational Development in the Soviet Armed Forces"]

[Text] All daily activities, combat and political training of Soviet Air-Force aviation personnel, just as of all Army and Navy personnel, are taking place under the emblem of the campaign to implement the decisions of the 27th CPSU Congress. The endeavor on the part of the winged defenders of the homeland to work even more persistently to increase vigilance and combat readiness, to strengthen discipline and order is being vividly revealed in the course of socialist competition under the slogan "We shall carry out the decisions of the 27th CPSU Congress, we shall reliably defend the achievements of socialism!" Communists are marching in the vanguard of this competition in Air-Force collectives.

The new revised CPSU Program adopted by the 27th CPSU Congress stresses: "The scale and complexity of tasks being carried out both in domestic and in international policy are placing higher demands on the party proper and on the level of its political and organizational activities. The leadership and guiding role of the CPSU in the Soviet society is logically increasing in the new historical conditions, and this is understandable because, as is stated in the CPSU Rules, the party is the highest form of sociopolitical organization, the nucleus of the political system, the guiding and directing force of Soviet society. This point also applies fully to the Soviet Armed Forces.

V. I. Lenin taught that Communist Party guidance of the Armed Forces is manifested first and foremost in the fact that all matters pertaining to defense of the socialist homeland, military organizational development, military practice and military theory are determined in precise conformity with party ideology and policy, on the basis of the party's decrees and instructions.

Manifestation of the guiding and directing role of the Communist Party in the Armed Forces is multifaceted. Nevertheless the main thing is that the CPSU,

guided by Marxist-Leninist theory, innovatively develops Leninist teaching on defense of the revolutionary achievements of the working people and defines the military policy of the Soviet State. "In view of the complex international situation and growing aggressiveness on the part of reactionary imperialist circles, the CPSU Central Committee and Central Committee Politburo are devoting unremitting attention to our country's defense capability and the combat power of the USSR Armed Forces, as well as to strengthening of military discipline," it is noted in the Central Committee Political Report to the 27th CPSU Congress.

Scientific elaboration of the problems of party organizational development in the military organization of the Soviet State as well as practical activities of political agencies and party organizations in the military has constituted and continues to constitute an object of tireless party concern. The Party Program and CPSU Rules as well as the Central Committee Political Report to the 27th CPSU Congress add a great many new things to this. They also reflect innovative development of Leninist principles of party organizational development, the wealth of experience amassed by the party over many years of its activities, the most important demands pertaining to further cohesiveness of CPSU ranks, development of intraparty democracy and strengthening of party discipline, concern with the prestige and authority of Communists, with increasing the fighting efficiency of primary party organizations, improving selection, placement and indoctrination of cadres and verification of execution, a scientific approach to party work, and increasing answerability on the part of each party member for his attitude toward his labor and for the pure countenance of a party member. All this applies to Air-Force political agencies and party organizations, which are continuously and rigorously measuring up their performance against the points of the Party Program, CPSU Rules, as well as decrees of party congresses and conferences and our party's Central Committee plenums.

Important tasks pertaining to further improving the work of party organizations proceed from the decisions of the 27th CPSU Congress. All Communists are called upon to gain a clear understanding of these demands and to implement them in a consistent and practical manner. The attention of Air-Force party organizations should be focused at the present time on further increasing combat readiness, mastery of new aircraft and modes of their combat employment, and improvement of training of highly proficiency-rated specialists. A resolute campaign against air mishaps and their causes, against unnecessary relaxation of demands and unnecessary situation simplification in combat training, and against a formalistic attitude in competition always has been and continues to be an important task. Emphasis is placed on specificity in conscientious implementation of adopted decisions, setting higher party standards, and lively organizational activity.

The Soviet Armed Forces have their own specific features. Their missions and organization are specific in large measure. This obviously must be considered in party organizational development. Innovatively applying its general principles, the Central Committee has clearly defined the specific features of organizing the work of political agencies and party organizations in the military. They boil down basically to the following.

The Soviet Armed Forces were established to defend the socialist homeland. Everything in the Soviet Armed Forces, including the party-political edifice and party organizations, should be continuously and constantly ready to make a rapid shift to a war footing. Therefore one of the main principles of party organizational development here is conformity between the structure of party organizations, political agencies and the party political machinery in the Army, Navy, and Air Force with the organizational structure of the Armed Forces. As we know, local party organizations are organized on the territorial-production principle. In contrast to them, party organizations and political agencies of military units are established on the basis of subunits, units, combined units, and large strategic formations. They operate actively both in permanent-station and in field or campaign conditions.

A well-proportioned and efficient system of party organizations is currently in operation in the Soviet Armed Forces: primary party organizations, party organizations equivalent to primary, shop-type party organizations, and party groups. In conformity with the Instructions to CPSU Organizations in the Soviet Army and Navy currently in effect, primary party organizations in the Air Force are established by appropriate political agencies in aviation regiments and other separate units and subunits, headquarters, combined units, as well as at all military establishments and educational institutions where there are at least 3 party members.

Party committees may be formed in aviation regiments with authorization by the party agency, when there are 75 or more party members. In this instance party organizations of squadrons, headquarters, and technical maintenance units are given the status of primary organization. Within primary party organizations of squadrons and battalions, if there are 3 or more party members, party organizations of detachments, flights, and companies may be formed, with the status of shop party organizations. There is also possible another structural arrangement, where party groups are formed in flights, companies, platoons, aircrews, gun and equipment crews.

The established structure of party organizations in the Air Force corresponds to the present stage of military organizational development and fosters the performance of purposeful and effective ideological and organizational work among all Air-Force personnel.

As we know, the Armed Forces are a strictly centralized organization with firm military discipline. It is important here to ensure unity of political and military control of all elements through the entire chain of command. Party-political work should be in conformity with the tasks of strengthening one-man command on a party basis. This makes it possible most fully to achieve unity of personnel will and actions, which in turn promotes flexibility and rapid switching from one accomplished task to the next, especially when it arises suddenly and unexpectedly. All this is extremely necessary in order to maintain a high degree of troop combat readiness and fighting efficiency. The one-man commander is responsible not only for operations and administrative activities but also for the political-moral state of personnel as well as the level and effectiveness of political work. Political agencies in turn perform not only party functions but are also a component of the overall system of military command and control. They have administrative functions in addition



to party duties. This ensures their effective participation in leadership and control and provides genuine guarantees of party influence on all aspects of daily life and combat training in the units and subunits.

And, finally, the special status of Army and Navy party organizations dictated the necessity of restricting the elective principle in these organizations. Only the directive agencies of primary and lower party organizations are elected. Political agencies are appointed, while party commissions attached to political agencies are elected for handling matters pertaining to acceptance to party membership and examination of cases involving individual party members.

There are also certain other specific features in the activities of Armed Forces party organizations. They include ensuring a solid interlinkage between political agencies, party organizations, and the party political edifice with the soldier masses, effective guidance and direction of public organizations, and daily party influence on all personnel. Criticism of orders and instructions issued by command personnel is prohibited, and special procedures have been established for handling cases dealing with one-man commanders.

The dialectical, innovative character of party organizational development in the Armed Forces was particularly vividly manifested during the Great Patriotic War, which demanded an all-out improvement in the level of party guidance and direction of the Armed Forces and strengthening of party-political work at the front. CPSU Central Committee General Secretary Comrade M. S. Gorbachev notes that during the Great Patriotic War the Leninist Party became a fighting party, merging as one with the war-fighting people. In the most difficult military segment of our history, it proved to be up to its vast responsibility for the fate of the homeland and led our country to victory.

Life moves forward. The missions assigned to the military are growing larger and more complex. The conditions of their activities are changing. Scientific and technological advance is exerting enormous influence on military organizational development. Large qualitative changes have also taken place in our Air Force in recent years. In these conditions party-political work in aviation units and subunits is called upon even more aggressively to develop and reinforce in military personnel those qualities formed by the socialist way of life and Soviet society, to broaden and deepen its influence on combat training and the daily life of Air-Force personnel. "The party and state have striven and continue to strive," emphasizes the Central Committee Political Report to the 27th CPSU Congress, "to ensure that the Soviet serviceman -- officer and enlisted man -- while carrying out his difficult duties, is aware at all times of society's concern and attention, and to ensure that our military serves as a school for teaching civic responsibility, courage and patriotism."

In the interests of increasing the effectiveness of party-political work, in recent years the party's Central Committee has carried out a number of measures, as a result of which the role of military councils, political

agencies and party organizations has become enhanced, and political and military indoctrination of personnel has improved.

Party organizations have become genuinely the political nucleus and cementing force of military collectives, including Air-Force collectives. Their ideological and organizational activities, the activists' lively word and example of flawless performance of assigned duties constitute an effective factor of party influence on military personnel. Party members in Air-Force units and subunits are highly respected. Carrying out the demands of the CPSU, party organizations in the Air Force accept into their ranks the finest pilots, navigators, engineers, technicians, and aircraft maintenance personnel, on whom a high degree of combat readiness of subunits primarily depends. Communists, for example, comprise more than half of excellent-rated individuals in combat and political training in the Air Force.

There are specific features to the organizational-party structure in the Air Force. These include first and foremost the existence of elaborate structures of party organizations, from party groups in separate aircrews to primary party organizations in units and higher-echelon headquarters; excellent quantitative indices of the party nucleus among officer (especially flight) personnel (more than 80 percent); a well-developed party activist network dictated by the highly-dynamic and multilevel nature of the tasks being carried out. Non-flying political workers can serve as secretaries-at-large of aviation regiment party committees and Komsomol committees. All other party activists are flight and engineer-technician personnel as well as officers of the various services. But it frequently occurs that a party committee secretary-at-large continues to fly as an aircrew navigator.

These features of the organizational structure of party organizations place an imprint on the specific features of intraparty work in aviation units. Each unit performs its own tasks, but their accomplishment is affected by the collective, combined actions of the personnel of the subunits and services.

The pilot is a principal figure, who implements the efforts of all collective outlays on each training sortie. Therefore the question of ensuring personal exemplariness by pilot-Communists and their attainment of the highest level of expertise occupies the center of attention of party organizations.

Since execution of each flight is a regulated, controlled process, primary party organizations place strict demands on the activities of party members at headquarters and in other elements of the overall system of command and control of combat activities and flight operations and on organization of coordination.

Air-Force units are continuous combat readiness units, and therefore principal attention in the activities of all Air-Force party organizations is concentrated on maintaining the requisite level of combat readiness on the part of each and every subunit, each and every crew, especially when standing alert duty. Party organizations in the Air Force, just as in the USSR Armed Forces as a whole, constitute an ideologically and organizationally unified fighting, tested and proven detachments of the CPSU, operating in strict

accordance with party ideology and policy. The winged defenders of the socialist homeland see their duty as implementation of the historic instructions of the 27th CPSU Congress.

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## WARSAW PACT PORTRAYED AS DEFENSIVE SHIELD AGAINST NATO AGGRESSION

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 30-31

[Article, published under the heading "At the Fronts of the Ideological Struggle," by Maj V. Ovsyannikov: "Truth Against Lies"]

[Text] The "psychological warfare" unleashed by imperialism cannot be called anything other than a special form of aggression and informational imperialism, trampling the sovereignty, history, and culture of peoples. It also constitutes outright political-psychological preparation for war, which naturally has nothing in common either with a genuine comparing of views or with the free exchange of ideas, which is so hypocritically claimed in the West. Nor is there any other way to assess actions whereby people are taught to look through a gunsight at any society which is not to the liking of imperialism.

From the CPSU Central Committee  
Political Report to the 27th CPSU  
Congress of the Communist Party of  
the Soviet Union

An event took place 31 years ago, on 14 May 1955, which was of exceptional significance for the fraternal peoples of the socialist countries: an historic document of friendship, cooperation and mutual assistance was signed in Warsaw -- the Warsaw Pact.

"History has never known a community of nations in which nobody possesses or could possess special rights and privileges, in which international relations have truly been transformed into relations between peoples, in which fruitful ties have been established and are developing at various levels -- from the highest level of party and government leadership to workforces," states the CPSU Program about the Council for Economic Mutual Assistance and the Warsaw Pact Organization. "Partnership multiplies the resources of the brother nations in building socialism and helps reliably guarantee their security."

Progressive peace-loving forces throughout the world greeted the establishment in Europe of a reliable bulwark of peace and security. In the camp of imperialist reaction, however, news of this was met with vicious attacks against the military-political alliance of the nations of the socialist community.

U.S. imperialism's shift to an undisguised policy of "neoglobalism" has resulted in the mid-1980's in intensification of brazen, no-holds-barred slander against the Warsaw Pact. A murky flow of bourgeois lies has inundated Western readers with the blessing of the current U.S. President, who stated outright that the Communists are hindering the Americans from carving up the world once and for all and therefore the United States should do everything it can to leave Marxism-Leninism on the ash heap of history. With their characteristic contempt for obvious facts, the ideological flunkies of imperialism, piling one lie upon another, attempt to present in a distorted manner to readers, TV viewers and radio listeners the aims and nature of the Warsaw Pact. Proceeding from prejudiced geopolitical conclusions, they attempt first of all to display the Warsaw Pact Organization as an "instrument of aggression." In particular, the air forces of the socialist armed forces are portrayed in books by Western authors as an "omnipresent specter" threatening the NATO countries.

In order better to understand the scientific bankruptcy and reactionary nature of bourgeois lies about the "aggressiveness" of the Warsaw Pact, let us return to the events which served as the reason for consolidation of the European socialist countries into a military-political alliance.

Creation of the Warsaw Pact was a response measure by the brother socialist nations to a dangerous policy shift by the Western powers, which had broken with the aims and principles of the anti-Hitler coalition. As a result of establishment of the North Atlantic Treaty Organization in 1949 and an entire system of aggressive blocs, as well as remilitarization of the FRG and acceptance of that country to NATO membership, there developed a genuine threat of another war in Europe. In these conditions there arose the need for constructive solutions and practical actions guaranteeing the security of the socialist countries. In particular, there was a need to supplement the bilateral treaties of friendship, cooperation and mutual assistance between individual socialist countries with a multilateral treaty. Creation of the Warsaw Pact proceeded from the objective requirements of unification of the efforts of the socialist nations in the area of foreign policy and defense and was dictated by their national and international interests. "Capital is an international force," stated V. I. Lenin. "An international alliance and fraternity of workers is needed in order to defeat it."

The Warsaw Pact Organization was a defensive alliance from the very outset. The Treaty states that the participating countries will take "coordinated measures necessary to strengthen their defense capability, in order to protect the peaceful labor of their peoples, to guarantee the inviolability of their borders and territories, and to provide defense against potential aggression." In contrast to the imperialist blocs, the Warsaw Pact is not a narrow, exclusive military organization but is open to membership by other nations which express the desire to fight for peace and international security.

The peace-loving nature of the Warsaw Pact proceeds from its genuinely popular character. The very nature of socialism, grounded on public ownership of the means of production, confirms peace without weapons as its ideal.

In contrast to this, the flywheel of preparations for war is spinning up to an unprecedented velocity in the capitalist countries. Nor is it surprising that it is primarily the U.S. monopolies which violently oppose agreements between the USSR and the United States on reducing nuclear and conventional arms. Since 1980 the profits of the major U.S. arms magnates have tripled on the average. The net profits of just the aerospace companies totaled 1.4 billion dollars for the first 9 months of last year. Termination of or even cutbacks in arms production programs would sharply diminish revenues for the monopolists.

The resolutions of the Conference of the Political Consultative Committee of the Warsaw Pact Member Nations, held in Sofia in October 1985, constituted an important event in the struggle by peace-loving forces throughout the world to end the arms race and achieve disarmament. In the declaration "Eliminating the Nuclear Threat and Taking a Turn for the Better in European and World Affairs" adopted at the conference, the leaders of the allied socialist nations, in addition to advancing new specific proposals, once again declared their readiness and willingness immediately to dissolve the Warsaw Pact with simultaneous dissolution of the NATO Pact, and to dissolve their military organizations as a first step.

In response to this, forces in the West proceeded with an intensive effort at dissemination of various myths presenting the USSR and its allies in a sinister form and utilizing as proof the "concealed meaning" of their peace-seeking proposals. One of these myths was dubbed the theory of "Finlandization." Its authors claim that if NATO is dissolved and U.S. troops are withdrawn from the European continent, the balance of forces will decisively shift in favor of the USSR, which the Soviet Union will allegedly be able to take advantage of to "seize" or "revolutionize" Western Europe. According to their fanciful conjectures, the USSR will consider the use of force unnecessary and will proceed to use its military might as a political instrument. As a result the Western nations will find themselves in a so-called "Finnish situation": they will be drawn into the "Soviet sphere of influence" without military occupation or "Sovietization." In the opinion of bourgeois authors, the countries of Western Europe are incapable of putting up anything in opposition to political pressure supported by military power due to their... "poor state of armament."

The participants in the Sofia Conference of the Political Consultative Committee spoke out resolutely in favor of stopping the further deployment of nuclear weapons on the continent and accomplishing a reduction in nuclear arms. They affirmed their resolve to seek the total elimination of nuclear weapons from Europe. But bourgeois ideologues also see a "false bottom" in this proposal as well. Here is an example of such an "exposure." It seems that the European socialist community opposes nuclear war not because it threatens human civilization but, in the opinion of one Western "researcher," because in view of the "superiority in conventional arms, in a nonnuclear

conflict between NATO and the Warsaw Pact, the latter has an indisputable capability to win." These bourgeois falsifiers, however, deliberately fail to mention that the Warsaw Pact nations seek to unleash neither a nuclear nor a nonnuclear conflict.

Obviously these pseudoscientific phony claims have nothing in common with reality. With the help of such claims the ideologues of imperialism attempt to distort the essence of peace initiatives by the brother socialist countries, to compromise the foreign policy of the Soviet State, and consequently to broaden artificially among the people of the West a social base of support for NATO armament programs.

Utilizing such an ideological cover, NATO leaders are pursuing a course of policy aimed at expanding the process of military preparations by the NATO member countries. This finds expression in a steady growth in their military expenditures, which have increased by a factor of 1.5 just in the last 5 years. According to official estimates by foreign experts, actual military expenditures by the European NATO countries reached 350 billion dollars in 1985. NATO authorities devote particular attention to increasing air power. Last year alone the air forces of the European NATO nations took delivery on more than 300 aircraft, including approximately 280 Tornado and F-16 tactical fighters, which are capable of carrying both conventional and nuclear weapons.

The military-political leaders of the fraternal alliance of socialist countries cannot ignore the fact that NATO proposed new aggressive doctrines and is building up nuclear and conventional arms at an accelerated pace, and are compelled to take response measures. As long as the imperialist NATO bloc continues to exist, it was noted at the 27th CPSU Congress, the party considers it essential to make every effort to help improve the activities of the Warsaw Pact Organization as an instrument of collective defense against the aggressive aspirations of imperialism and of a joint struggle for a firm peace and expanded international cooperation.

The imperialist bourgeoisie, in devising plans to crush socialism, prefers to deal not with a united front but with separate, disunited socialist countries. For this reason falsification of the nature of interrelationships within the military-political alliance of nations of the socialist community and the Soviet Union's role in that alliance has become one of the directional thrusts of subversive anticommunist strategy. Some "Sovietologists" claim that the USSR is using its military might to control the armed forces of its allies and thus is limiting their political role, while other "scholars" portray the Armed Forces as a "key stabilizing factor in Eastern Europe." In recent years attacks against the Warsaw Pact Organization have become more sophisticated. A theory of so-called "political reliability of socialist armies" appeared fairly recently in the Western press, a theory which boils down essentially to the authors' elaboration of "criteria of reliability" of the armed forces of the socialist nations in different variations of war with the NATO bloc as well as... with the Soviet Union.

What aim do the Western authors pursue? Ideological sabotage (and such deliberations cannot be called anything else) against the military-political cooperation of the socialist countries is directed first and foremost at



undermining the foundations of their unity, at weakening their military might, and at transforming, as is noted in a NATO document, the Warsaw Pact "into an easily-broken tool." It is therefore not mere happenstance that anti-communists, in their endeavor to split the unity of the socialist countries, count heavily on creating an atmosphere of suspiciousness in relations between the brother armies and at isolating them and setting them against one another. It is clearly evident in the example of the above-cited "theory" however, how contrived and antiscientific all these phony claims and concepts are, the purpose of which is essentially to play on the nationalistic prejudices and a false notion of "national sovereignty." The ideologues of anticommunism deliberately make no mention of the community of root class interests of our countries and the most important component part of their national, governmental interests -- a military-political alliance with the USSR as a guarantee of preserving socialist achievements in these countries.

Within the framework of the combat alliance, the USSR Armed Forces are *primus inter pares*. The sole possessors of nuclear weapons within the Warsaw Pact, they continue to remain the principal factor in defending peace and in holding imperialist aggression in check. And this not only does not detract from the role of the brother armies as a factor of peace but, on the contrary, gives them greater confidence in their capabilities.

Relations among the countries of the NATO bloc stand out in sharp contrast. No matter how loudly "Atlantic solidarity" is proclaimed, the apologists of capitalism are unable to ignore the acute conflicts between the members of the North Atlantic Pact caused by capitalist competition. Even "duty of alliance" does not hold back the U.S. monopolists from the temptation to extract profit from supplying military hardware to their partners. Here is a typical example. In 1975 Norway, Denmark, Belgium, and the Netherlands, in conformity with NATO plans, decided to upgrade their fleet of military aircraft. The U.S. company General Dynamics was awarded the contract following fierce competition with companies from other countries. Norway, for example, ordered 72 F-16 fighters at a total cost of 2.9 billion kroner. By 1979, however, the initial price per aircraft had increased sharply, and 4 billion kroner were paid for the ordered aircraft. This "deal of the century" worked out exactly the same for Denmark.

The brother parties soberly assess the danger lying hidden behind the hypocritical imperialist "concern" for their national interests. They resolutely resist any and all attempts to set these interests against the common responsibility of communists for the fate at world socialism and internationalist duty to the working people of the other socialist countries.

The entirety of postwar history attests to the fact that the Warsaw Pact is an alliance of equal socialist states, serving as a powerful barrier against which aggressive imperialist intrigues have shattered and will shatter in the future. The alliance is marking its 31st anniversary as an effective instrument of peace and security of peoples. The men of the Air Force, who are totally dedicated to their patriotic and internationalist duty, in implementing the decisions of the 27th CPSU Congress are strengthening in every possible way the fighting alliance with the airmen of the armies of the



socialist nations, standing wing to wing with their class brothers, their brothers in arms, reliably guarding the skies of the homeland and the nations of the socialist community.

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## HISTORY OF AIR-TO-AIR COMBAT REVIEWED

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[Article, published under the heading "Tactics and Simulation," by Military Pilot 1st Class Col Yu. Kislyakov and Candidate of Military Sciences Col (Res) V. Babich: "History of Aerial Combat"; conclusion of five-part article, see Nos 1-4, 1986]

[Text] The tactics of the first Russian and, subsequently, the first Soviet fighters were formed and shaped in the battles of World War I and the Civil War. When peace came, it brought the opportunity to analyze the factual material. In order to ensure that air-to-air combat -- a complex military phenomenon -- underwent further development, it was essential to synthesize the experience amassed in the course of practical combat operations and to make a scientific forecast. This was demanded by technological advance and the development of new aircraft and aircraft weapons.

Russian, and particularly Soviet fighters had logged considerably fewer air-to-air engagements than the French, British, or Germans. It was therefore appropriate to borrow from their experience all elements which could prove useful in the new conditions. As V. I. Lenin wrote: "...The conduct of that army which is not willing to master all types of weapons, all means and techniques of combat which the enemy possesses or may possess is foolish or even criminal."

Yevgraf Nikolayevich Kruten produced the first synthesized description of foreign fighters. Examining the "Fundamentals of German Tactics Based on Observations on the French Front," he brought to light the most significant rules and procedures which the German pilots observed: it is more advantageous and therefore advisable to shift aerial combat into airspace above friendly territory; to attack only when friendly aircraft possess numerical superiority; to attack only when one is at a higher altitude than the adversary, and if one is lower, one should avoid an encounter; attack only once.

The French were of the opinion, however, that one should be the first to attack; that one should attack with the element of surprise, taking advantage of the adversary's blind spots and impossible firing angles, and approaching

to point-blank range to ensure accurate fire; the adversary should be destroyed wherever he is found.

The British in turn considered precise, sure actions grounded on swift decision-making and knowledge of the adversary's weaknesses to be characteristic features of their tactics, as well as patience, protracted waiting for a favorable moment to initiate combat, where the attack could be sure, and advance planning of an engagement.

O. Stuart wrote in a book entitled "Tactics of Aerial Combat" that courage alone, attended by unconcern, while of value, is less beneficial than actions grounded on a scientific approach. In a difficult situation a knowledgeable pilot makes better decisions, and this is a guarantee of stick-to-itiveness and courage. Captain Ball was distinguished by particular boldness and employed risky devices, but he operated according to a definite scheme and always had a plan worked out in advance. When preparing his plan he would think through not only variations of combat for himself but also all possible actions his adversary might take, planning tactics and attacks regardless of which would ultimately be employed.

While not ignoring deficiencies, Ye. Kruten noted the aggressiveness, improvisation, and great skill of the French (employment in combat of complex maneuvers of which only highly-skilled pilots were capable), and he stressed the Germans' discipline, precision, and persistence.

Of interest in this respect are critical comments made by our adversaries. German ace von Richthofen wrote, for example: "The French like to present puzzles and attack with the element of surprise. But it is not difficult to avoid traps, since in the air you cannot hide, and no invisible aircraft has yet been invented. Therefore only novices fall for such ploys. Incidentally, the Gallic blood sometimes comes to the fore, and then a Frenchman will attack, but in this instance as well the French aggressive spirit lacks persistence."

French ace Rene Fonck considered as weaknesses of German tactics adherence to rigid schemes, lack of initiative on the part of subordinates, and blind following of manuals and regulations. In view of these points, he emphasized knocking out the flight leaders, who exercised control and fire coordination in combat. Deprived of their commander, wingmen would proceed to swing back and forth in confusion, seeking to come up with a decision. Ten seconds of uncertainty on the part of his adversary was enough for Fonck to close and take him out with an accurately-placed burst. Both he and the German aces were of the opinion that it was better to attack "15 enemy aircraft behind friendly lines than 4 aircraft behind enemy lines."

Fonck taught novice pilots not to take unnecessary risks. He worked out his tactics in detail and never undertook a maneuver if its consequences were not clear. In this as well he was close to the British. In French aviation circles Fonck was called the "aerial mathematician." As (de Shavan) wrote in his book "The Stork Fighter Group," however, Fonck could not compare in heroism to the more popular (Ginemer), and he was depicted as always merely observing and waiting for an opportunity for an easy victory.

An analysis of combat experience indicated that the tactics employed by the belligerent nations contained strong points, shortcomings, and common approaches. In view of this fact, Ye. Kruten concluded that "aerial combat is too individual for each specific instance, and no precise recipe can be given." There are basic principles, however, and they boil down to the following:

it is necessary to spot the enemy as soon as possible, for he who spots the adversary first gains the initiative and therefore victory is half won;

close undetected, from that direction which the adversary considers to pose the least threat;

assume a position higher than the adversary prior to the attack -- this increases closing speed, provides the element of surprise, and a morale advantage;

when completing the process of closing, endeavor to enter the adversary's blind area;

approach to point-blank range, and only then commence sure fire;

definitely be aware of everything around your aircraft, especially just prior to the attack; a fighter pilot should "have eyes in the back of his head";

in order to fool the adversary, employ feints, and then close swiftly;

once the adversary is in your sights, employ every bit of skill and composure in order not to let him get away unpunished;

when working out combat tactics, reach a conclusion in advance on the capabilities of one's own aircraft and that of the adversary;

if the adversary sees that he is about to be attacked, one should be concerned with safety to one's rear.

The principles formulated by Kruten formed the basis of an indigenous Russian school of aerial combat. They were adopted and further developed by Red military pilots. At the same time, as former aviation group commissar A. Kozhevnikov wrote, "The World War gave us classic examples of conduct of one-on-one combat and passed on to us only weak, not fully elucidated modes of group combat; consequently the Red Air Force possessed practically no skills or even principles of group actions."

But why is it that no experience was amassed during the long war years in this important area of fighter combat activity? As Civil War hero I. Pavlov stated, "it was still difficult at that time to unify flight personnel as like-minded persons at the tactical level. In spite of fine individual proficiency and amassed combat experience, for many pilots group flying even proved to be a totally new mode of work, extremely difficult in execution."

One of the main obstacles was a lack of means and, consequently, also modes of command and control.

Interesting in this regard is a statement by French investigator (de Shavan), who wrote that French pilots, especially combat aces, were hindered by their ingrained individualism. But the Germans, having assimilated the lessons of the war, in November 1917 formed patrol groups consisting of single-seater aircraft interacting with one another. Their coordination and discipline made it possible at first successfully to withstand attacks by single (even if highly-proficient) French pilots, and subsequently to transition to offensive group tactics.

The French fighter pilots were convinced that the age of one-on-one combat was past, but they were unable to overcome their distaste toward group flying. It took such air aces as (Matton) and (Ozhe) to be shot down to break through the stubborn resistance of the pilots by force of order. Nevertheless even punishment could not reeducate the "free rovers," who were accustomed to taking off and fighting at their own personal initiative. Affairs on the ground were of no interest to them, and they selected an air mission situation whereby it was easier to shoot down more aircraft. The command authorities on the one hand hailed their heroes, while on the other hand they realized that things could not continue like that. But they were unsuccessful in "reining in" the individualists right up to the end of the war, and group combat did not develop precise delineation in tactics.

The combat experience of Red military pilots, however, acquired in the very difficult conditions of the Civil War, advanced a very important factor to the forefront. In order to eliminate a number of adverse conditions and to transform the first Soviet aviation group into a "durable and indestructible weapon," it was necessary "to select the best available personnel," to inspire them with fighting spirit and to instill solid cohesion and conscious discipline for successful combat against a powerful adversary. It is characteristic that the leaders also included less highly-trained, as yet unknown combat pilots on whom the command authorities could fully rely. This principle of welding together an efficient revolutionary nucleus proved fully warranted. It was applied not only among flight personnel but ground personnel as well.

What did we learn from the first Soviet fighter pilots? They proved that, possessing courage and total faith in a just cause, one can "parry any treacherous blow into the back of the young Worker-Peasant Republic." Flying extremely worn-out equipment against a numerically superior, better-equipped adversary, Red military pilots achieved brilliant victories.

In order to achieve success in a complex air situation, boldness and courage should be reinforced with expert flying skill and backed up by clearly-marked offensive tactics. Regardless of how a battle began, it should end with an attack on the enemy; when you are dealing with a numerically superior or better-armed adversary, if an attack is unsuccessful one should not forget about shifting into a defensive position with a skilled maneuver, and one must always bear in mind one's principal mission and endeavor to attack again with determination.

Red military pilots made the tactical elements of combat directly dependent on psychological elements. To quote I. Pavlov, in aerial combat moral forces "must be viewed as artillery." When they have been smashed, the attacker is proceeding across an open field with nobody to defend it. Moral superiority determines not only the nature of an engagement but even the distance at which machinegun fire commences. The staunch, tenacious warrior, who has tight control of his nerves, can approach his adversary to close range and shoot him down. The wavering pilot who has not become battle-hardened opens fire at long range, failing to do any damage to the enemy aircraft.

Elevating mandatory shift from defense to offense to the status of law, Red fighter pilots realized that this was a very complex element, acquired not only by desire but by experience as well. It was therefore important to do everything possible to seize the initiative at the beginning of combat and to take up an advantageous position in advance of the adversary. The effort to win time was reflected in a practical manner in organization of forward observation posts, which provided "early" information on the enemy. This made it possible to take off in advance and to climb to altitude, which would subsequently "be converted into speed when closing and would deprive the adversary of his technical advantages."

The lack of sufficient time dictated the appearance of a new mode of combat operations -- combat air patrol. It is very important to note that fighters did not simply "hover" in the sky waiting for the enemy. The experience of A. Shirinkin's squadron on the Western Front indicates that prior to putting aircraft aloft into the airborne alert zone, the command authorities would predict the enemy's probable actions and determine his plans and intentions. Thus the Nieuports did not fly back and forth aimlessly but would take up an initial position in advance.

Combat engagements resulting in downing enemy aircraft also produced another new technique -- operations from ambush. Experienced pilots would be placed on ground alert at advanced landing fields. Taking off "by eyeball," that is, after visually spotting the enemy, they would take him unawares in the initial phase of his mission. Intercepts were successfully accomplished even above the neutral zone (forward edge of the battle area). Ambushes incorporated two tactical principles: the element of surprise, and economical expenditure of resources. Considerable importance was attached to innovation, which was dependent on one's attitude proper toward combat as a complex military phenomenon. Here is what a practical expert, I. Pavlov, commander of the 1st Aviation Group, wrote about theory of combat: "Air-to-air combat alone can justify the existence of fighter aviation. It is whimsical, capricious, and rich in fatal occurrences of chance, is difficult to study and requires an extremely cautious theoretical approach. Needed here is a serious group elaboration on the basis of practical data of an entire campaign, but under no circumstances of separate individuals. At the present time we can discuss aerial combat only in its general features (at least with our Russian experience). It would be a mistake to learn only certain modes of attack, figuring that they would come in handy as a measuring stick of combat. Fighter tactics are too varied and do not permit the establishment of any rigid patterns."

At the same time it was emphasized that the inadmissibility of a standardized pattern, that is, repeating the same techniques and modes of combat in an altered situation, by no means negates certain mechanisms and principles. For example, participants in aerial engagements during the Civil War particularly stressed the principle of combination of maneuver and fire. These two elements contained firm inner linkages and were examined as an integral whole. Disruption of the linkages directly affected combat results. Maneuver was grounded on the pilot's flying proficiency, while fire was grounded on his marksmanship. VESTNIK VOZDUSHNOGO FLOTA noted that flying a fighter means possessing a consummate mastery of advanced flying skills and mastery of the machinegun. In aerial combat the number of combinations of maneuvers is large and diversified and depends entirely on the pilot's ability quickly to gain his bearings in a situation, in space, and relative to the adversary.

It is very important to consider the strong and weak points of the "aircraft-pilot" system with which one is engaged in combat. If one is inferior in speed, rate of climb, maneuverability and killing power, one's only remaining hope is that the adversary is a worse pilot and weaker in tactics.

The following point, closely linked with the preceding one, pertains to the fighter pilot's level of professional training. Experience indicated that universality of aircraft and pilot, that is, attempts to make an aircrew perform simultaneously several tasks at different levels, is a "bad thing," condemned by practical experience. "It is precisely the narrowness of the tasks of fighter aviation which can make it stronger and endow it with the essential powers to gain air supremacy." In the aerial battles of World War I and the Civil War, two thirds of all aircraft kills were made by air aces, whose training was strictly goal-directed, and whose mission was limited to destroying enemy aircraft. In connection with this, for example, the French pilot (de Marankur) stated in the book "Fighter Aviation": "One can argue about whether it is necessary to build so many fighters. But constantly to send them out to photograph or bomb means failure to understand the properties of this weapon."

The transition to group flights was dictated by circumstances. The fact is that bombers had begun flying bombing strikes in groups. On 6 October 1920, for example, a group of 10 aircraft in a single formation, with I. Petrozhitskiy flying leader, attacked a squadron of Vrangeli's ships near Taganrog. It was necessary to maintain the bomber formation, while repulsing mass enemy attacks on our installations. The question of organizing groups of fighters with close fire linkages and mutual support between aircrews in a combat formation was placed on the agenda. Pilots ran into a number of difficulties here, which proved to be quite serious: in training, command and control, and distribution of resources. This problem required thorough substantiation and rapid solution.

As for the technical equipment of Soviet aviation, VESTNIK VOZDUSHNOGO FLOTA wrote after the Civil War: "Russia's aviation was weaker than the adversary in equipment. Therefore we should count on only one possibility: to develop our equipment and weapons to the highest degree of perfection. Of considerable importance thereby is to make a determination on types of combat aircraft of

various areas of specialization. The most important thing is to know 'what is it for,' and then it is easy to figure 'how to do it'."

On the whole fighter combat activities are appraised according to the results of aerial engagements. In a synthesized study entitled "Pyat let stroitelstva i borby, 1917-1922 gg." [Five Years of Construction and Combat, 1917-1922], A. V. Sergeyev, commander of the Red Air Force, noted that they had not succeeded in gathering complete summary data from the fronts. And this was extremely difficult to accomplish, since at that time they were not keeping record of combat sorties with analysis of aircrew actions. According to figures in the book "Istoriya VVS Sovetskoy Armii" [History of the Soviet Army Air Forces], Red military pilots conducted a total of 144 (recorded) air-to-air engagements in the Civil War and downed 21 enemy aircraft. It is evident from materials on award of the Order of the Red Banner to pilots that success in aerial engagements was achieved by A. D. Shirinkin, N. N. Vasilchenko, D. N. Shchekin, G. S. Sapozhnikov, Yu. P. Krekis, Ya. Ya. Gulyayev, I. P. Kuznetsov, P. A. Pentko, V. Ye. Baturin, and F. A. Ingaunis.

This is obviously an incomplete list, but even on the basis of these figures one can state that more than 14 percent of aerial engagements produced results. Let us take for comparison figures from the Great Soviet Encyclopedia: more than 100,000 aerial engagements were recorded in World War I, in which 8,073 aircraft were downed (8 percent produced results). Thus the first Soviet fighter pilots, who as a rule were outmanned and flew old equipment, had somewhat higher combat effectiveness in comparison with the overall indices.

Unquestionably successful accomplishment of combat missions was also fostered by the Russian aviators' high morale -- a powerful weapon in the hands of skilled warriors. The professional skill and moral resources of flight personnel became toughened in combat for a just cause which, to quote V. I. Lenin, increases one's strength, broadens one's mental outlook, increases one's capabilities, clears one's mind, and forges the will.

Red military pilots laid down the foundations of the Soviet school of air tactics and methods of training combat pilots, and defined the directions to take in the development of fighter aircraft and their combat employment. The experience of aerial combat subsequently fought in the skies over China, Spain, and above the Khalkhin-Gol River demonstrated the correctness and exceptional vitality of the basic tactical principles. Subsequently further developed and honed to perfection on a solid scientific-technical, ideological-political and moral-psychological foundation, they enabled Soviet fighter pilots to achieve brilliant victories over the vaunted fascist air aces in the savage battles of the Great Patriotic War and to raise high the prestige and fame of our Air Force.



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The authors would like to express thanks to the staff of the Central Institute of Aviation and Astronautics imeni M. V. Frunze and the USSR State Library imeni V. I. Lenin for assistance in selecting materials for these articles.

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## SQUADRON MAINTENANCE PERSONNEL MASTER NEW AIRCRAFT

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 38-39

[Article, published under the heading "Advanced Know-How Put Into Practice by Aviation Engineer Service," by Lt Col V. Krapivin, regimental deputy commander for aviation engineer service: "Mastering a New Aircraft"]

[Text] This year the airmen of one of our squadrons are performing an important task, mastering an aircraft which is new for some of the aircrews. I recall the initial phase of transition-training. It required the adoption of substantial revisions not only in the methods of training flight personnel but also in the activities of aviation engineer service specialist personnel.

We became convinced that the new aircraft imposed higher demands on scientific organization of labor and specialized training of aviation engineer service personnel and their level of technical knowledgeability. In view of this fact, the unit methods council drew up for transition-training aircrews a list of training drill topics for flight, engineer and technician personnel, which was approved by the commanding officer.

Initially, however, when there first arose the question of theory training for aviation personnel, in particular of the squadron under the command of Military Pilot 1st Class Maj A. Shchetin, the command authority discussed, among other matters, specific initial candidacies among the best pilots, engineers and technicians to study what for them was a new aircraft. The initial theoretical training group for aviation engineer service specialists was headed by the squadron deputy commander for aviation engineer service, Maj I. Martysyuk. Sr Lt I. Knyazev was designated his assistant. This group also included detachment technical maintenance unit chiefs Capts P. Krayevskiy and Yu. Revenko, Sr Lt N. Semenov, aircraft technicians Sr Lts O. Volodin, S. Rubtsov, O. Koval, and other of the most highly-proficient aviation engineer service specialists. Very high demands were placed on them.

I shall not discuss in detail the process proper of theoretical mastery of an aircraft. I shall merely state that this training was conducted in a purposeful manner and was organized at a high methodological level. Subsequently the entire group visited another aviation subunit, where they mastered the new aircraft. While there the men received the necessary hands-

on experience in servicing and maintaining the aircraft. After this a team was formed to take delivery on aircraft and to ferry them to the squadron.

As we know, selection and placement of personnel in each specific work area forms the basis of the success of any undertaking. This correct demand by our party at the present stage was stated with new emphasis in the documents of the 27th CPSU Congress. Therefore aviation engineer service personnel, before commencing to service flight operations involving the new aircraft, went through technical training drills and thoroughly rehearsed the procedures and sequence of performing the most complicated operations and inspections involved in operation and maintenance of numerous systems, component units, computers, and other onboard equipment.

Experience indicates that flowcharts and process schedules for comprehensive inspections help organize airmen's work activities, shorten the time required and improve the quality of aircraft servicing turnaround, and of course this requires of each and every aviation engineer service specialist a high degree of skill, precision, and the ability to meet the strictly-allocated time schedule. It is for good reason that our engineers always devote the closest attention to determining the makeup of maintenance crews and their training activities.

We have a schedule which indicates the duties of aviation engineer service assigned personnel in the conduct of training sessions. The unit deputy commander for aviation engineer service, for example, organizes and conducts training drills on the most complex topics and, as new aircraft continue to arrive, he tests ranking engineer and technician personnel. He also keeps a record of training classes.

The specialization-area engineers determine subject matter and prepare training class flowcharts, hold training classes directly on the aircraft, and work on making display stands, models, various charts and other visual aids, which greatly assist the engineer in the process of testing and inspection. They serve as an additional source of information, essential for thorough analysis of the operation of a given aircraft system or component unit.

Quite frankly, a continuous, intensive effort to achieve qualitative improvement in methods of training aviation engineer service personnel would be in process for all intents and purposes from the moment we would receive new aircraft. Naturally we devoted principal attention to training the engineers and specified essential measures to achieve further improvement in their professional and teaching skills. The commanding officer, his deputies, and staff officers organized a series of lectures and seminars on efficient training and indoctrination of aviation personnel. We also periodically hold training conferences. At one such conference, for example, we examined in detail matters pertaining to analysis of aircraft operation on the basis of flight recorder tapes, perfected a method of calibration and plotting of calibration graphs, plus other items pertaining to servicing and maintaining a modern fighter. Sr Lt Yu. Zinchenko, airframe, powerplant, and ejection system group chief, spoke on this topic. Practical training classes were then held with airmen involved in servicing and maintaining the new aircraft. They were subsequently tested.

At another training conference attended by all flight and technical personnel of Maj A. Shchetinin's squadron, Maj I. Martysyuk held practical training classes involving detailed inspection of airframe and engines, and also organized a training drill with aviation engineer service personnel on the most complex inspections of the new aircraft's systems. After this Capt P. Krayevskiy and Yu. Revenko and Sr Lt N. Semenov, under the oversight of the detachment commanders, worked out with technical personnel elements of practical coordination with aircrews from the time a pilot receives the aircraft from the ground crew to the time it returns to the field and taxis back to the ramp. Process documentation and operation-by-operation oversight exercised by aviation engineer service supervisor personnel were revised in the process of these training activities.

In this connection I should like to mention what in my opinion is an important detail of a problem of future significance. I am talking about the work done by aircraft technicians with higher engineering training. One can state without exaggeration that the demands placed on servicing and maintenance of a modern aircraft are so considerable today that the knowledge a specialist possessed yesterday is no longer sufficient today. Continuous, comprehensive independent work aimed at broadening one's scientific and technical knowledgeability is needed. I believe that I am correct in stating that today's aircraft technician should be equal to the engineer in the level of his specialized training.

We should note that experienced officers are in the majority in the squadron led by Maj A. Shchetinin. They set the pace in knowledgeable equipment servicing and maintenance for those specialist personnel lacking a higher education, help them broaden their professional knowledgeability and, of course, seek new and more effective modes and techniques of spotting various equipment problems. These officers are right-flankers in mastering the new equipment.

Here is an example. Sr Lt Yu. Utkin, graduate of a higher service school, serves in the squadron under discussion. This officer, who already has an engineering degree, is working hard on continuing to improve his professional expertise and is constantly looking for new ways to improve aircraft operating efficiency and to improve the operation of all aircraft systems. It is for good reason that he has the solid reputation in his outfit of being a real expert on aircraft systems.

...It happened during a flight operations shift. A pilot, receiving his aircraft from the technician, climbed into the cockpit and fired up the engines. After checking the engines, he could taxi out to the runup pad. But instead of the customary arm signal permitting him to commence taxiing, Sr Lt Yu. Utkin unexpectedly signaled him to shut down. Naturally the pilot immediately reported this fact to the tower and did not proceed with his training sortie.

It was subsequently ascertained that when the engines were fired up the aircraft technician sensed that there was a problem with one of the engine systems, on the basis of indirect indications which were almost impossible to

detect, a problem which might become apparent only in the air. Officer Utkin's diagnosis was fully confirmed when he checked engine operation in the fueling area of the ramp.

As we know, training facilities are of considerable importance when mastering a new aircraft. Several specialized classrooms have been set up in the squadron in question. The regiment's specialization-area engineers and servicing group chiefs displayed initiative and innovativeness in setting up these classrooms, especially Majors V. Miloradov, A. Khozyainov and G. Korchachenko, Capt V. Pleshko, and Sr Its Yu. Zinchenko, A. Vazhov, and K. Lomov.

Adoption of scientific organization of labor helped substantially increase the labor efficiency of aviation engineer service specialist personnel and helped them improve their knowledge of theory and the requisite skills. This unquestionably played an enormous role in subsequent mastery of the new aircraft by aviation personnel.

Nevertheless, in critically evaluating achieved performance levels, aviation engineer service specialists realize that a great deal still remains to be accomplished in the area of adopting scientific organization of labor in each and every squadron, detachment technical maintenance unit, and maintenance group. We therefore make an effort to reveal all unutilized reserve potential, of which there is a great deal, thoroughly analyze it at training classes and training conferences for aviation engineer service personnel, at party and Komsomol meetings, as well as when totaling up socialist competition results.

Our airmen unanimously support the initiative of the men of the regiment which initiated socialist competition in the Air Force and have set for themselves the following goal: to achieve in this training year -- the year of the 27th CPSU Congress -- additional success in combat training, to ensure a high degree of effectiveness of each and every training class, each and every training drill on modern aircraft, and to service every flight operations shift with excellent quality, without air mishaps or mishap-threatening situations.

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## PROBLEMS WITH ADHERING TO FLIGHT OPERATIONS SCHEDULES

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 40-41

[Article, published under the heading "For a High Degree of Flying Efficiency and Flight Safety," by Military Pilot 1st Class Maj S. Lukashov, aviation squadron deputy commander, and Military Test Pilot 1st Class Lt Col A. Isavkin, aviation regiment deputy commander: "Schedule Pluses and Minuses"]

[Text] Flight Operations Shift "Musical Score" -- by Maj S. Lukashov

Cutting through the thick darkness, the floodlight beams illuminated the smooth surface of the concrete runway. Soon an aircraft flown by Military Pilot 1st Class Capt V. Ivanitskiy landed. This officer had never failed to adhere to the flight operations schedule. He always rigorously observes the requirements of guideline documents. This time as well Ivanitskiy flew all his training sorties on schedule and with a mark of excellent. The fighter-bomber had barely cleared the runway when red signal flares shot skyward above the control tower. Flight operations had ended. Aviation personnel were in a good mood: they had completed all training sorties on schedule and with excellent quality. Pilots, technicians, mechanics, and specialist personnel of servicing and supporting subunits had demonstrated improved job expertise.

What predetermined success? In my opinion a great deal depended on the fact that each individual realized the need for precise, absolute observance of the flight operations schedule, for this fundamental document, which determines the activities of all specialist personnel during flight operations, sets the work rhythm in the air and on the ground. It is for good reason that a flight operations schedule is sometimes compared with a musical score, where it is precisely indicated when given musical instruments commence playing. Distortion of the "melody" of the flight operations shift and disturbance of its rhythm can lead to the most serious consequences.

I shall cite the following example in this connection. A pilot was preparing to take off as last in his flight. He climbed into the cockpit of the combat jet, switched on his radio, but failed to check the frequency to which it was tuned. Naturally he heard nothing but noise. In addition, his attention was diverted and he did not realize his mistake until he saw the leader's aircraft taxiing toward the active. By the time he fired up his engine, the next

fighter-bomber element had begun moving onto the taxiway. Failing to report to the tower, the pilot shouldered his aircraft into this group, introducing confusion into the takeoff sequence. Although everything worked out in the end (the flight took off and worked its maneuver sequence), this pilot's actions made work harder for the tower and created certain difficulties for other aircrews.

Of course such a misstep is a rare occurrence. But it could not help but alert us. This annoying miscue was a consequence primarily of the pilot's absence of self-possession. The flight operations officer also should have taken prompt action. Endeavoring to meet the total aircraft hours logged target, however, he proceeded otherwise. Thus one breach of regulations led to another.

Having suitably appraised this incident, we made the decision to step up efforts to instill in personnel a feeling of responsibility for high-quality execution of the flight operations schedule and to ensure that it gives even more purposefulness and organization to aviator combat training. The results of subsequent flight operations shifts and tactical air exercises confirmed that a correct decision had been made.

As we know, the more highly organized a flight operations shift is, the fewer violations occur. Bearing in mind that planning is the heart of control and management, we devote particular attention to preparing the flight schedule. We endeavor to take into consideration not only each individual's level of proficiency but also all nuances of preflight preparation, takeoff, landing, and taxiing to the ramp, as well as suggestions by the flight commanders -- the immediate mentors of the combat pilots, for a flight commander knows better than anybody else the individual peculiarities of his charges, their level of knowledge and degree of proficiency, and is capable of unerringly deciding what maneuver sequence should be scheduled for a pilot during the next flight operations. This is particularly essential since every new assignment requires specific knowledge and improved skills.

According to our established tradition, the flight commanders regularly report to the squadron commander their ideas on preparing flight operations schedules. In our subunit we carefully seek to ensure conformity between the nature of the scheduled maneuver sequences and the level of proficiency of each combat pilot, as well as the methodological sequence of performing forthcoming assignments and meeting standards for flight hours logged.... Direct participation by the flight commander in scheduling enables him more actively and purposefully to influence the development of his men as combat pilots.

But intelligently preparing a flight schedule is only part of the job. Capt V. Derevyanko, for example, commander of an excellent-rated flight, maintains that the success of a training sortie and schedule discipline will be determined in large measure by how a pilot prepares for air work. Here too a great deal depends on the instructor, his demandingness and educator talents. The majority of our flight commanders, after planning maneuver sequences, assign specific tasks to their men, carefully organize and conduct ground preparation, and keep a careful watch to ensure that training sorties are

performed precisely on schedule and with excellent quality. They study the requisite sections of guideline documents and always share their knowledge and experience with the pilots.

It would be incorrect, however, to claim that this is the extent of the flight commanders' activities as military educators and immediate superiors. In the course of flight operations they supervise their men and exert constant, unabating influence on them, seeking observance of flight operations discipline, high-quality flight performance and flight safety. They monitor the sequence and procedure of taxiing out, takeoff intervals, join-up, and formation during target search and attack. If the commander takes off before his pilots, he always informs them of weather conditions, the air situation, and peculiarities of flying procedures and navigation. All this helps the pilots perform successfully in the air.

Military Pilot 1st Class Maj A. Tokarenko is a model of high efficiency and discipline both in drawing up the schedule for the flying day and in carrying out the schedule. He is deservedly considered an expert at combat flying. Major Tokarenko always prepares thoroughly for flight operations, never deviates from the plan and schedule, and one can state without exaggeration that in large measure because of this he carries out every training mission with excellent performance results. His men also do a good job.

Participation by engineer and technician personnel in planning and the practice of readying a standby aircraft have proven fully effective. As we have determined, this constitutes an important reserve potential in ensuring a smooth rhythm to combat training.

One night a tire blew on an aircraft as it was taxiing over to the central fueling point. Ground crewmen immediately proceeded to replace it. But there was very little time to turn the aircraft around for another training sortie. In order not to chance falling behind schedule, the commander instructed the pilot to take the standby aircraft up on his next flight. The mission was accomplished without excessive haste, on schedule and without departing from the guideline documents.

Unquestionably precision planning and scheduling should rest on a solid logistics foundation. A great deal also depends on the ground maintenance personnel providing flight operations support. High-quality preparation of the airfield, reliable operation of power sources, and prompt replenishment of fuel, fluids and gases are a guarantee of a highly-efficient flight operations shift. In the subunit under the command of Capt S. Uskov, for example, there was not a single instance of delay with training sortie departures due to mistakes by groundcrew personnel. This is because in this subunit the schedule is treated as a formal order, upon receiving which the airmen tighten their will and increase their mutual feeling of responsibility for high-quality accomplishment of the activities scheduled for the flight operations shift. Nor is it surprising that this outfit was a repeated leader in socialist competition among district air forces subunits.



## Efficiently Utilizing Flying Time -- by Lt Col A. Isavkin

The flight operations schedule constitutes an irrevocable law governing the flight operations shift. While refinements and adjustments can be made in the schedule during the planning stage, from that moment when it is signed by the appropriate officials and approved by the unit commander during the readiness check, it becomes a document which requires rigorous and precise execution.

This would seem to be axiomatic. In actual practice, however, we must admit that departures are sometimes made from the schedule. The sequence of performing training missions and the flight regime are changed for various reasons in the course of flight operations. The result is disruption of the precise work rhythm of aviation specialist personnel on the ground and in the air, which leads to unwarranted haste, and sometimes to conflictive instructions. I know from my own experience what a negative effect all this has on a pilot just before taking off.

Why does this happen? In my opinion there are several reasons for this. I shall discuss some of them.

Competent preparation of a flight schedule is a truly complicated and critical process. Only experienced, well-trained aviators are capable of correctly and thoroughly evaluating all the requisite data (proficiency of personnel, extended ground time on the part of some pilots for various reasons, specified aircraft utilization factor, and time required to turn aircraft around to go out again) and, on the basis of this data, correctly to prepare a flight schedule.

Not all commanders, however, especially young ones, devote adequate attention to flight operations scheduling. They reason approximately as follows: it's not so difficult, and we're not exactly novices at it. The result is serious errors in the methods sequence of pilot training and departure from the requirements of the documents which ensure mishap-free flight operations. In Maj V. Fimenkov's flight, for example, a cross-country training sortie was scheduled for instructor pilot Capt V. Afonin. But he was overdue on meeting his periodic helicopter navigation check flight requirement. Fortunately everything turned out all right: regimental senior officers discovered the violation of regulations upon checking the flight schedule.

It also sometimes happens that errors of omission in planning and scheduling become evident as soon as the green flares indicating commencement of the next flight operations shift rise above the airfield. For example, simultaneous takeoff by 5 or 6 helicopters, somehow incorporated in the flight schedule, results in them being forced to stand idle with running engines, in fuel overconsumption, undue haste and nervousness.

An important factor in precision, efficient flight operations is well thought-out organization at the section and aircrew level. A special role here is played by the section commanders -- the most experienced, skilled pilots, who are well acquainted with flight operations. Our section commanders Maj V. Andreyev, I. Kolosov, Capt V. Dubov and others devote considerable time and effort to their men, constantly concern themselves with their professional

development, and keep close watch to ensure that they adhere to the requirements of guideline documents.

Unfortunately cases sometimes occur where a section commander usurps the functions of an instructor pilot and uses flight operations time only as an opportunity to "do some flying for himself." By scheduling 3 or 4 hours for himself during a flight operations shift, such a commander fails to keep an adequate watch on his men. There is no need for us to mention the requisite comprehensive, firm oversight and meaningful, specific assistance to aircrews. For this reason the commander cannot justifiably demand full observance of flight operations schedule discipline, since he is concerned only with logging his own flying time. The quality and safety of flight operations suffer as a result.

Such negative phenomena can be avoided with well thought-through planning and scheduling of the flight operations shift at the section level, as well as subordination of personal to group interests.

High intensity of flight operations, when 16-17 aircrews are aloft at the same time, places considerable demands on the flight operations officer. His professional experience, professional and moral qualities are of decisive significance. A great deal, however, also depends on the aircrews and the sense of responsibility on the part of aviation personnel for efficiency and safety of flight operations and for adhering to the schedule. Problems with keeping operations moving are inevitable if these elements are lacking. If this happens, in order to correct the situation, the flight operations officer is forced to violate regulations. He endeavors arbitrarily to reshuffle the flight schedule, which leads to undesirable consequences.

Particular attention is devoted in our unit to the problem of skilled organization and precise execution of flight operations. The command authority, staff, aviation engineer service specialist personnel, party and Komsomol activists place special emphasis on achieving from all aviation personnel prompt and flawless execution of their job duties. We also directed attention to the following. The result of an aircrew's attempt to take off ahead of schedule is that the flight operations officer refuses to give takeoff clearance. This means that the helicopter waits on the ground for 10 or 15 minutes with its engine running. This results in building up excessive engine time, in excessive fuel consumption, as well as other totally unwarranted costs.

How can this be avoided? We decided to make fuller use of the force of influence of the community. At the present time matters pertaining to observing schedule discipline and economizing in tach time and fuel consumption are not only unrelentingly monitored by supervisor personnel but are also mandatorily considered when totaling up socialist competition results at the section, squadron, and unit level.

A detailed analysis of negative elements during flight operations, holding violators of regulations strictly to account, and exchange of experience and know-how provide additional impetus for precise performance by aviation personnel, and develop in them the endeavor unswervingly to observe flight

operations shift discipline and to raise their level of job proficiency in competition with one another.

Aviation engineer service specialist personnel give effective assistance to the command authorities in these endeavors. Monitoring fuel consumption and equipment operating time and comparing these figures with helicopter time logged according to the flight operations schedule, the section technical maintenance unit chiefs provide good material for an objective analysis of equipment utilization during flight operations. Based on these figures, a commander can call the careless and remiss to account and reward outstanding crews. This creates an additional incentive for precise observance of the schedule for the flying day or night and economical expenditure of resources. This in turn disciplines aviation personnel.

It is no easy matter, but it is absolutely essential to ensure a high degree of efficiency of utilization of flight operations time, as well as flawless and timely execution of scheduled flight activities, while strictly observing measures ensuring flight safety. This task can be successfully accomplished in all subunits without exception, with the condition of absolute adherence to a carefully-prepared flight operations schedule -- the law governing the flight operations shift.

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## MISSION TO REPAIR, RESTORE TO SERVICE SALYUT 7 STATION

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 42-43

[Article, published under the heading "Cosmonaut Training," by Candidate of Technical Sciences Col V. Gorkov: "Unusual Flight"; concluding part of two-part article; see AVIATSIYA I KOSMONAVTIKA, No 4, 1986]

[Text] Space Begins on the Ground

The final practice session to rehearse rescue procedures was conducted in close to real conditions. In the concluding phase the scenario suddenly called for an emergency descent, and at the same time smoke was pumped into the simulator. The cosmonauts hastily transferred from the descent vehicle into the living compartment, where the protective masks were kept. But this time they were not industrial masks but regular-issue masks, and sealed to boot. And there are certain procedures one must keep in mind. When breathing in a protective mask, one must not forget that each mask lasts only a certain breathing time. The greater the breathing frequency, the faster the breathing supply is used up. The cosmonauts donned pressure suits, protective masks, and returned to their work stations.

The training sessions was approaching an end when one of the methods specialists, Anatoliy Petrovich Khizhnyak, noticed that something was wrong with Savinykh.

"What's the problem, Viktor Petrovich?"

"I'm not getting enough air. Can I take off my mask?"

"That's a decision for the mission commander. The smoke has not been eliminated."

"Viktor, relax your breathing, take it easy, and we shall finish our work," Dzhaniybekov interrupted their conversation.

The cosmonauts ended the practice session tired but satisfied. They were given these protective masks as a memento. Vladimir Dzhaniybekov was pleased:

"I'll send mine to the Tashkent Suvorov School. For quite some time they have been asking me to send them something for their museum."

"Practice sessions on the full system mock-up were very important in preparing for this mission. This probably affected mood and work performance, right?" I asked Khizhnyak.

"No question about it. When you're being watched, you want to do a better job," he replied. "Of course the rescue and recovery system is the same for all cosmonauts. Everybody goes through it, and everybody must become thoroughly knowledgeable about it, regardless of whether one is going up for 24 hours or for 100 days. I doubt if there is anybody who does not value his life. Paradoxes are encountered at every step, however. Cars have been equipped with seat belts for years, for example, but a lot of people don't use them. The situation is analogous here. After one or two 'flights,' some people begin treating these practice sessions with less seriousness. Of course the activities do not require a great deal of intellect; all operations are simple, but the procedures must be committed to memory and mastered to a degree of automatism. Vladimir Dzhanibekov is a fine example of a responsible attitude toward practice sessions on this equipment. I have been working with him since 1979. I am sure that he has mastered all the details and has forgotten nothing. But when I suggest omitting one operation or another, Vladimir Aleksandrovich is against it: 'No, teacher, hold on there: the schedule calls for it, and we shall do it.' He is quite engaging with his unpretentiousness and modesty."

Modesty, integrity, and competence -- these are the traits which, as was stressed in the CPSU Central Committee Political Report to the 27th CPSU Congress by CPSU Central Committee General Secretary Comrade M. S. Gorbachev, are today required of a genuine Communist. It had been almost a year since V. Dzhanibekov's fifth mission, but he had remained true to his principles. It is precisely these character traits of Vladimir Aleksandrovich which were most frequently mentioned by specialists at the Cosmonaut Training Center imeni Yu. A. Gagarin when this cosmonaut's name came up.

#### Reconnaissance in Force

The above military term concisely but aptly characterizes the actions by cosmonauts and specialists during the first 24 hours of crew activity in orbit. This technique is generally employed when it is impossible to obtain the required information by other methods. Specially designated subunits are tasked with obtaining intelligence information. The commander in whose area reconnaissance in force is being conducted observes its progress and results, in a state of readiness to exploit. In like manner mission controller V. Ryumin mobilized all specialist personnel at Mission Control. They were prepared to come to the cosmonauts' assistance at any moment. We shall be discussing the events which took place during those days.

The cosmonauts spotted the Salyut 8 station as soon as it emerged from the Earth's shadow.

"'Dawn'! This is 'Pamir'," the "Kosmonavt Vladimir Komarov" command-telemetry ship out in the Atlantic relayed Dzhanibekov's voice to Mission Control. "The station is very, very bright, 10 times brighter than Jupiter."

This was the fifth occasion the callsign "Pamir" had sounded above our planet. It was first heard in January 1978 at Baykonur, when V. Dzhanibekov and O. Makarov were launched into orbit on board the Soyuz 27. This was followed by 8 years of hard work connected with training and preparation for a joint mission with B. Magyari, Zh. Gurragchi, Jean-Louis Chretienne, S. Savitskaya and I. Wolk, and V. Savinykh. V. Dzhanibekov's talent unfolded and respect for him grew from one mission to the next.

Vladimir Aleksandrovich is one of those fortunate individuals who have found their calling in life. He had dreamed of the heavens since childhood: at first he wanted to become an astronomer, and later a pilot. The second desire won out. He knows and loves aviation, but he won recognition in the space program, which brought him closer to the stars and gave him the opportunity to experience velocities and altitudes beyond those which a pilot can experience.

I have repeatedly heard the following spoken by specialist personnel: "Dzhanibekov is a born cosmonaut." When you tell him about this, he shrugs his shoulders: "Maybe it's more apparent to others."

It certainly is. Perhaps he possesses natural gifts, but the main and determining factor in his development was labor. Persistent, purposeful work to improve himself and systematic practice and training -- this was the guarantee of his success. And on that day, 8 June 1985, a great deal depended on the skill of the crew, particularly on Dzhanibekov.

What did the cosmonauts feel as they spotted the station? The best assistance in answering the question is objective monitoring. Analyzing the actions of the crew members in controlling the spacecraft from the telemetry record, one can state that they experienced happy moments, familiar perhaps only to a pilot. This was a moment of the highest spiritual enthusiasm, when there is no gap between thought and action, and the ease with which a machine carries out your will inspires strength and confidence.

The cosmonauts took their first laser rangefinder measurement from a distance of about 8 kilometers. They looked at the display -- the figures showed a discrepancy. They again took a range measurement and computed velocity. Their doubts vanished: it was necessary to correct the most recent predicted parameters received from the ground. They entered the new figures into the onboard computer, and the computer issued the command to switch on the propulsion unit on all channels.

The Soyuz T spacecraft employs a motion control system based on the principles of a platformless inertial system, with an onboard digital computer. This system makes it possible to optimize dynamic processes, increase their accuracy, and substantially broaden the craft's functional capabilities. In addition to control, the system monitors execution of maneuvers and fuel consumption and can make the decision to change operating conditions if deviations occur.

The control system has a display unit. In particular, information on the parameters of relative motion, required changes in velocity, fuel consumption and the like is displayed in the form of phrases, indexes, numbers and graphs. This was the case on preceding missions both for V. Dzhaniybekov and V. Savinykh.

This time Vladimir Aleksandrov stayed glued to the starboard viewing port, observing and measuring. Viktor Petrovich positioned himself at the display. He made calculations, compared their results with those predicted by the control system, and reported them to the mission commander.

The predicted and actual range once again began to diverge. Somewhere beyond three and a half kilometers from the station, the thrusters fired a second time. V. Dzhaniybekov immediately reported to mission control: "DPO operating, velocity decreasing. We've got to go over to manual control, or else we'll drift apart."

"Go, transition," the mission controller concurred.

"Switching to thruster controls. I have taken over control, range three and three tenths kilometers. Station precisely at center of pilot's sight. Angulars practically zero."

Another report came a minute later: "The station is very brightly illuminated, as if it were of machined aluminum with a yellowish admixture. The panel seems to be turning. We shall approach closer and take a look."

Things livened up at mission control. The personnel manning the rows of monitors engaged in animated conversation, engendered by the hope of finding a functioning power supply system. The cosmonauts soon reported, however, that the solar panels were motionless.

15 minutes later the cosmonauts had approached right up to the Salyut 7, but in contrast to past missions, nobody saw on the screen at mission control either the approach process or the station itself. The TV cameras were positioned along the spacecraft's longitudinal axis, and specialist personnel would be able to see the station only when the crew shifted to the regular control station and turned the craft.

"How is the station oriented in relation to the Earth?" "Dawn" asked.

"We are at a distance of 80-100 meters from its port side. The docking assembly on the transfer compartment side is facing us."

In 14 minutes they would be entering the Earth's shadow. But even on the night side the crew could operate the craft: they had a night-vision device and sufficient fuel. The cosmonauts avoided this experiment, however. They transferred to the regular control station.

"Switching on docking sight," the people at mission control heard. "I am equalizing velocity."

The Salyut 7 flashed on the screen and proceeded to grow in size.

In manual control of the docking process, the cosmonaut performs two basic functions: he estimates the craft's deviations with the aid of 3-dimensional targets or a system of luminous index marks and, manipulating two controls, operates thrusters which generate the required forces and moments.

Progress reports came in: "Contact!", "Capture!"

The joyous exclamation from orbit merged with thunderous applause at mission control.

Tension decreased, but not for long. The scheduled processes of hard docking between spacecraft and station, linking the systems, and testing the docking seal were in progress. Once again there were minutes of nervous anticipation: what awaited the cosmonauts on board the station?

It was ascertained in the process of docking that the electric power was in fact down on the Salyut 7. The pressure equalization valve between the transfer compartment and docking assembly, electrically operated, was not responding. This was an abnormal situation, but it had been provided for during training back on the ground, and before opening the hatch the crew employed a pressure equalization plug.

Passing through into the station's transfer compartment, the cosmonauts proceeded to take air samples and analyze them. They detected no harmful impurities. This news was reassuring to all. Just in case, however, the cosmonauts were instructed to have their protective masks ready.

When Dzhanibekov and Savinykh opened the hatch to the work module, they smelled an unusual odor. They had to don their protective masks. It was just as silent in the work module as in the transfer compartment, and it was pitch-black. All viewing ports were tightly covered with metal caps. Dzhanibekov took several flash photographs. They uncapped the viewing ports; there was frost on the glass. At this point they noted that the temperature on board the station was below freezing. They detected no signs of a fire. Removing their protective masks, they realized that the odor resulted from the fact that the compartment had been standing idle: there was no power, the ventilation system had not been operating, and the air had become stagnant.

Generally speaking, the cosmonauts were prepared for the low temperature on board the station. They had expected the air temperature to be approximately 5 degrees above freezing, and therefore during the training sessions they had been provided with warm clothing. What they saw, however, took everybody by surprise: the water had frozen in the "Rodnik" [Spring] system. The table turned out to be the only "warm" spot. On the table they found symbolic welcoming bread and salt and a cordial letter from the "Mayaki" [Beacons] -- L. Kizim, V. Solovyev, and O. Atkov, who had resided almost 8 months on board the station. Thus ended this reconnaissance in force.



The on-the-spot situation reports transmitted from the station laid the puzzles and conjectures to rest. And although the situation was less than optimal, the plan to revive the station was clear.

#### In Orbit

The first thing the cosmonauts did was to hook up regenerators and impurity absorbers to the fan in the transport craft. They directed the flow of purified air through the hatches in the direction of the work compartment. Pumping air through, they removed carbon dioxide and unpleasant odors to the greatest extent possible.

Their further stay in orbit depended on how rapidly they could restore the station's power. The simplest solution was obvious: connect the storage batteries directly to the solar panels. Severing the cable, the cosmonauts wired the circuits and proceeded to stand watch at their improvised battery charger. All solar panel drive units are supposed to be sensor-oriented toward the sun, so that charge exceeds discharge. This essential condition in the power system had failed. At some moment the drives had failed, and the reverse process began -- the storage batteries discharged.

It was necessary to catch "daylight" to charge one set of storage batteries, and then switch the circuitry to another set upon entering the shadow. It took more than 24 hours in order partially to restore the power system to service. Why just partially? The priority item was to provide power to the switching gear, so that it could automatically handle subsequent charging operations.

Three days after docking, the station gradually began to come to life. The impurities filter was able to purify the air, and the fans which were switched on from time to time would mix the air. Gas analyzers were switched on to monitor carbon dioxide partial pressure. The regenerators also were returned to operation after warming up.

Now it was time to restore water supply. Possible schedules for bringing "Rodnik" on line had been analyzed at mission control, and they recommended that the cosmonauts limit their daily water consumption to 1.3 liters. The situation required sharpness of wit on the part of the crew members, and they did not lose their composure. They used field-expedient means to heat the water lines: an electric heater and a "Kinosvet" [bar of floodlight bulbs for movie-taking] unit. The "Rodnik" began producing water ahead of schedule.

"The crew worked unusually efficiently," stated life-support systems specialist V. Varrava. "We were experiencing a good deal of tension back on the ground at that time. During the initial period the cosmonauts even sought to calm our nerves. They performed system maintenance and operation procedures quite competently, precisely following the manual. Any technical suggestions they made were always meaningful and to the point. It was pleasant talking with them. One had the feeling that they were approaching their work with a highly responsible attitude."

The crew still had 90 days ahead of them. They would be repairing equipment, replacing scientific apparatus, testing a new EVA suit, deploying additional solar panels, and conducting research according to the mission program.

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## TOUR OF SPACE PAVILION AT OSTANKINO EXHIBIT

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 44-45

[Article, published under the heading "The Contemporary Era and Scientific and Technological Advance," by N. Konkov (deceased): "The Space Program: Road to Peace and Progress -- Report from the Exhibit of Achievements of the Soviet National Economy"]

[Text] "The exploration and exploitation of space should be carried out solely for peaceful purposes, for the development of science and production, in conformity with the needs of all peoples."

From the CPSU Program

The space pavilion at the Exhibit of Achievements of the Soviet National Economy is always highly popular with visitors.

"Every year we have more than 6 million visitors," states the pavilion's chief methods specialist, A. Kozub. "This figure includes several hundred thousand foreign visitors. Space as well as scientific and technological advance represent the principal theme of the exhibit. It persuasively demonstrates the Soviet Union's successes in investigating the universe. Our task consists not only in displaying space hardware but also in relating in a well-reasoned manner which the public can understand the principal stages of space exploration and the scientific fields which have developed on the basis of this exploration, fields which have broadened and in large measure altered our concept of the Earth and its atmosphere, the sun and the planets of the solar system, the stars and structure of the universe. Today there is not a single field of science and technology in which the achievements of the space program are not being utilized. Space research results are useful to specialists in agriculture, geologists, mariners, doctors, and specialists in a great many other professions. I suggest that you join the tour which is about to start, led by our senior methods specialist, Pavlichenkova. Incidentally, Alla Viktorovna has been preparing a specific-topic exhibit on the 25th anniversary of Soviet manned space exploration, dedicated to Yuriy Alekseyevich Gagarin."

We begin our tour of the pavilion with the entrance hall. Alla Viktorovna relates to the tour group the history of the creation of rocket technology and space exploration in the USSR -- an important area of technological advance. This hall contains the portraits of scientists and designers: K. E. Tsiolkovskiy, S. P. Korolev, N. I. Tikhomirov, M. K. Tikhonravov, V. P. Glushko, M. K. Yangel, A. M. Isayev, and M. V. Keldysh. The crowning exhibit item in this hall is the first artificial Earth satellite.

Examples of space hardware are on exhibit in the next two halls.

"Our pavilion has been open since 1967," Pavlichenkova continues. "Sergey Pavlovich Korolev took active part in its creation. The exhibits were prepared by the USSR Academy of Sciences and Soviet industrial enterprises. These are full-scale mock-ups, exact copies of actual space hardware. Here is a representative of the most numerous family of unmanned vehicles investigating near-Earth space -- a satellite of the Kosmos series," the guide paused at an exhibit. "They number more than 1,700 to date. In March of next year we shall be marking the 25th anniversary of the Kosmos series. In addition to performing a large aggregate of scientific tasks, the satellites in this series have in recent years been increasingly more frequently utilized in the economy."

We examine the Kosmos 1000 navigation satellite, launched into orbit in March 1978. It took part in the development of a satellite navigation system developed to determine the position of ships in the World Ocean.

We are delighted to learn that the space program has enabled scientists to discover many secrets of the planets of the Solar System. The Soviet Venera 1 unmanned probe flew the first interplanetary mission. This took place a quarter of a century ago, in February 1961. Thus was born one of the pivotal areas of the Soviet space program -- study of the planets with the aid of unmanned probes.

"We see here the descent vehicle of the Venera 13 probe," the senior methods specialist explains. "Communications were maintained with it for 127 minutes. In March 1982 it made it possible to transmit to the Earth color panoramic photographs of this mysterious planet. Prior to that time we had used Venera vehicles to learn the temperature on the planet's night side, gas pressure and density, which is 60 times great as at the Earth's surface.

"Scientists have recently concluded that the planets of the terrestrial group and their moons must be studied not only as astronomical but also as geological objects," Alla Viktorovna continued her spiel. "A comparative planetological analysis of their history helps us better understand the nature of celestial bodies and sheds light on unknown pages of the geologic history of the Earth. And one cannot help but be proud of the fact that the world's first mission to another celestial body was flown by the Soviet Luna 2 probe. Our planet's natural satellite was studied from orbital vehicles and landers, its surface was explored by lunar rovers, and man set foot on the lunar surface for the first time. Soviet unmanned probes and American astronauts brought lunar soil samples back to Earth. Prior to that time only meteorites had 'presented' us with material from space. Scientists believe that the

solutions to many terrestrial problems have become more evident through the crater-pocked, dust-covered "lunar window." The Moon has provided us with the most ancient rocks, which saw the universe in the Solar System's days of infancy, and offers the cratered-surface countenance which also characterized the Earth at an early stage in its existence. Investigation of the Moon can already today bring benefit to man. For example, study of the mechanisms of lunar seismicity will help scientists in forecasting earthquakes."

...Our group stopped in front of the next display -- the Lunokhod 2 unmanned lunar rover. This space robot, weighing 840 kilograms, landed on the Moon on 16 January 1973. It was controlled from the Earth by a five-man team. The vehicle has 8 wheels and carries a large number of information and measuring sensors (including a TV camera), an onboard control system, and means of communication with the controlling team. Electric power was provided by solar panels. The TV camera enabled a terrestrial operator to sense his presence on the lunar terrain.

The guide told us that over a period of 5 months Lunokhod 2 traveled 37 kilometers over difficult terrain. A total of 86 lunar panoramic photographs and more than 80,000 images of the lunar surface were transmitted back to Earth. The physical and mechanical properties of the soil were measured on a regular basis, chemical analysis of the composition of rocks was performed, and variations in magnetic field and luminosity of the lunar sky were determined. Laser ranging experiments were performed.

Today science and technology have reached a level whereby it is becoming possible to design and build industrial robots which can respond even to ultrasound and infrared rays which are beyond the capabilities of the human sensory organs. They are capable of operating in conditions of radiation, high pressures, high and low temperatures, and the vacuum of space. The development and extensive utilization of robots together with existing automated production equipment is not only a technical and economic task but also an important social problem. Its solution will free up a great deal of manpower needed by our nation's economy and will radically alter the character of labor in the production process. High productivity, an even rhythm, quality, as well as multiple-shift operations will be secured.

The Basic Directions ratified by the 27th CPSU Congress call for the development of totally-automated production processes which can be quickly and economically rearranged, as well as industrial-robot systems and lines. Total automation is one of the most important directions of scientific and technological advance. At least two thirds of labor productivity increase in the current five-year plan is to be obtained through utilization of scientific and technological advances. Robots will also become man's faithful assistants in orbit.

...The group proceeded to the dome hall, which contains the Manned Space Flight exhibit. We stopped by the famed Vostok spacecraft. Alongside it the visitors see an ejection seat with a mannequin wearing a spacesuit.

"The cosmonaut's couch served not only as a work station but also as an ejection and emergency rescue device," the senior methods specialist

explained. "It was equipped with oxygen tanks, with oxygen automatically fed into the spacesuit helmet."

Yuriy Gagarin's space flight was the beginning of all present and future accomplishments on the road of space exploration. Approximately 60 Soviet cosmonauts have flown missions on spacecraft and orbital stations since Gagarin.

We see their portraits in two galleries. The total number of persons worldwide who have flown in space has reached 200.

The time is drawing closer for more intensive utilization of space. According to scientists' predictions, the main task of the space program lies ahead -- industrialization of near-Earth space.

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## WEST EUROPEAN ALTERNATIVE TO SDI APPLAUDED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) p 45

[Article, published under the heading "Readers Request," by Col V. Yakunin: "'Eureka'"]

[Text] Having advanced the so-called "Strategic Defense Initiative" three years ago, the Reagan Administration, employing its favorite tactics of persuasion, promises and behind-the-scenes arm twisting, proceeded with an all-out effort to "work on" its NATO allies as well as the governments of Australia, Japan and Israel, with the aim of enlisting them to participation in the "Star Wars" program. Things reached the point where in March of last year the United States sent to these countries letters with a proposal in the form of an ultimatum: to inform the Americans within 2 months of their desire to participate in the program.

U.S. allies responded to this demand in different ways. It did not take much argument to persuade the Thatcher Government and Chancellor Kohl's cabinet, for example, to take part in the overseas plans to militarize space. Italy did not give its consent until March of this year, while Belgium, Portugal, Israel, and other countries are still "thinking it over." But the governments of France, Denmark, Norway, and Canada have stated that they will not take part in SDI.

At the same time French President Mitterand, in response to the U.S. ultimatum, proposed that the West European countries form a "European agency for the coordination of scientific and technical research," called Project Eureka. According to the president's statement, this project constitutes a group of scientific research programs, the practical implementation of which should in the current decade substantially lessen the technological gap between Western Europe on the one hand and the United States and Japan on the other, in such advanced fields as electronics, biotechnology, automated systems, the aerospace industry, robot engineering, and laser technology. In short, the goal is to protect the European economy against excessive dependence on U.S. and Japanese technologies.

Proceeding from political considerations, France is determinedly stressing the "civilian" thrust of its initiative, although French officials do not rule out

the possibility that results achieved in carrying out Project Eureka could in the future find application in the military area.

French proposals for Project Eureka include West European joint research on three principal programs: "Euromatique" -- development of supercomputers; Eurobot -- development of third-generation robots; Eurocom -- development of modern communications systems; Eurobio -- utilization of new biotechnology methods in agriculture and medicine; and Euromat -- development of new structural materials.

The first intergovernmental conference on Project Eureka was held in Paris last July, attended by the ministers of foreign affairs and scientific research of 17 countries (Belgium, Denmark, France, the United Kingdom, Greece, Ireland, Italy, Luxembourg, the Netherlands, FRG, Austria, Spain, Norway, Portugal, Sweden, Switzerland, and Finland) and European Community commission members. As was reported, the main result of the conference was approval given by all participants to the French plan and its principal scientific research program areas. According to one of the ministers this date, 17 July, became the birthday of Eureka.

At the same time the conference results indicated that the countries participating in the project have been encountering a great many major problems of an organizational and financial nature. Great Britain maintains, for example, that the Eureka program should be financed exclusively by private industry, while France advocates government financing and the FRG favors a combination, with a majority role, however, played by private industry. In confirmation of this, France announced a government budget appropriation of 1 billion francs this year for Eureka, while the FRG announced a budget appropriation of 50 million marks (120 million francs).

The French are moving fairly cautiously in advancing their initiative, endeavoring not to antagonize potential partners, particularly the FRG and Britain. They are stressing that Eureka is not directed against SDI, and consequently parallel participation by West European countries in the two programs simultaneously is not ruled out. At the same time it was suggested that the West European countries "not divert" their resources to the U.S. project but become involved in the project of the West European community, that is, in work which will allegedly give them genuine benefit and will prevent a "brain drain" to America.

The second European Intergovernmental Conference on the Eureka Program was held last November in Hannover (FRG), with the participation of 18 countries (Turkey joined the countries listed above). As West German foreign minister Genscher commented, all participants noted with satisfaction the positive response Eureka has evoked directly within European industrial and scientific circles. The general concept of the program and a declaration of principles, stating the goals, criteria, structure and methods of implementation of this program were adopted at the conference.

What will Eureka become for Europe? Will it have a purely peaceful directional thrust or will it become an obvious contributory element toward implementation of the U.S. Star Wars program? No matter how veiled the



statements by officials of Western countries regarding the goals of Project Eureka, one is clear: a high technological level can be achieved as a result of its implementation, which will play an important role for industry of the future and in the conquest of space. The results of practical implementation of each of the areas of scientific research, however, do not rule out the possibility of development of offensive space weaponry and a European ABM system. Will Eureka become a European SDI? The future will tell.

The Soviet Union, working persistently to prevent spread of the arms race into space, proposed at the 40th UN General Assembly Session, as we know, an extensive program to unite the efforts of nations in the peaceful use of space and employment of space technology to meet the economic and social needs of all peoples. One must assume that this concept of "star peace" will be grasped by the European countries and that in the present critical period they will take practical measures to prevent the danger of deployment of weapons in space, which threatens all mankind.

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COMMANDING OFFICER OF AIRBASE COMMUNICATIONS SUPPORT BATTALION PROFILED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) pp 46-47

[Article, published under the heading "They Support Flight Operations," by Maj A. Tarabrin: "Commander Crossroads"]

[Text] Lt Col N. Korolev, commander of a separate communications and electronic support battalion, is a holder of the Order for Service to the Homeland in the USSR Armed Forces, 3rd Class. He is distinguished by thorough knowledge of his job, a high degree of activeness, the ability to complete a job once started and to mobilize the efforts of his men on successful accomplishment of assigned tasks. This officer organized in a methodologically correct manner the process of mastery by his men of new equipment and ahead-of-schedule completion of a control tower which meets the requirements of modern flight safety.

Cleared to Land

I first met Lt Col N. Korolev on the airfield right after our An-22 landed. His men and the flight operations officer had warned us by radio that the weather was rapidly deteriorating and subsequently helped our aircrew get onto the final approach heading. They monitored our flight from the ground from radar blips, ensured the proper operation of the compass locators and electronic landing systems, and promptly switched on the runway floodlights.

I already knew a great deal about Korolev from documents and comments by his superiors: the son of a combat veteran, he had studied at a higher military aviation engineering school, and subsequently commanded a platoon and a company. He graduated from the Air Force Academy imeni Yu. A. Gagarin. He has served as commander of a separate communications and electronic support battalion at this base for 4 years now. For two of these years his unit has been a socialist competition winner.

"I don't deserve the credit for this," stated Nikolay Dmitriyevich in an unhurried manner. "The credit goes to the entire outfit, the party and Komsomol organizations."

Lieutenant Colonel Korolev does not like to talk about his accomplishments. That is not in his character. He feels that in carrying out one's duty one should perform only high-quality work.

Talking with Nikolay Dmitriyevich, one senses that he has the ability to get people to like him. Calm and sober-minded, he presents his thoughts in a leisurely manner, considering every word. One senses a firm inner strength in this individual. Some feel that he is a bit meticulous about everything. But he jokes: "It's inherited. My ancestors from way back lived on 'difficult' land, obtaining every grain by the sweat of their brow. My father taught me discipline from childhood. Even today he sometimes tries to instruct me."

Nikolay Dmitriyevich handed me a letter: "Read it."

"I had various experiences at the front, but I had one CO I was extremely fond of. Everybody in the company loved and respected him, although he was strict. He wouldn't stand for any funny business, but he would back his men up to the hilt. Before making a decision, he would weigh all the factors and examine everything to the tiniest detail, in order not to make a mistake. You, son, must also not make a mistake. You are a commanding officer. You are responsible for men and their lives....," his father wrote.

"Well, I have got to pay him heed," said Korolev, shoving the letter into his breast pocket.

#### Word Followed by Deed

We walked over toward the control tower, the gathering point of a great many communications links. Nikolay Dmitriyevich was quite willing to talk about his men's work. They handled dozens of various facilities, radios of all types, modern electronic and lighting equipment, intended to assist pilots in the air.

"This is our airfield," Nikolay Dmitriyevich proudly gestured with his hand. "Its navigation systems, which handle not only takeoff and landing but aircraft control as well, are one of the main guarantees of flight safety."

Nikolay Dmitriyevich's operation is complex indeed. Profound engineering knowledge and solid skills are needed to operate and service modern equipment. And the battalion commander gives a fine example. He has thoroughly studied all the equipment and knows the battalion's specialist personnel well not only by last name, name and patronymic, but also by character, personality, and ability. He inspires his men to engage in innovative search for new, more efficient ways to perform their difficult tasks.

Fairly recently the subunit received more modern communications transceivers. In working with this equipment, however, by the end of a shift the radio operators would be very tired: they would be fatigued by the greater radio noise, due to the wider frequency band and greater power. "It would be a good idea to design a noise squelching device," Korolev thought to himself, and instructed Maj V. Kochanov, his deputy for technical affairs, to work on this

problem. He suggested how to proceed in order best to accomplish this difficult task.

Soon innovators built and installed an additional squelch device. Now the radio operators' working conditions have improved considerably.

Problems of shifting the airfield over to emergency power were also solved through innovative search. The battalion commander was displeased by the fact that, although a new control tower had been brought into service, it still took considerable time, for example, to disconnect a damaged power supply system in emergency conditions and to fire up their own emergency generators. Nikolay Dmitriyevich shared his thoughts with his deputy commander for technical affairs. Maj V. Kochanov heads the battalion's efficiency innovator group. He, an experienced specialist, has come up with many technical ideas which have been put to practical application.

They gathered together the technical innovators and discussed the problems of concern. They then proceeded enthusiastically to look for the right solution. It was difficult, but nevertheless the group of innovators headed by WO I. Shashkov achieved success. Its suggestion was acknowledged to be the best and was adopted. Thus they designed and built a synchronization device which makes it possible to perform several operations at the same time, within seconds: disconnect the regular power line, fire up the diesel engines, and connect the airfield equipment to the standby power. This greatly increased the combat readiness of the communications and electronic support facilities.

#### Formal Invitation

That evening we met in the battalion commander's office. Nikolay Dmitriyevich spoke with enthusiasm, absentmindedly shifting an envelope back and forth on his desk. Then, suddenly remembering, he took out of the envelope a card with a picture of two gold rings. He was about to say something when somebody suddenly knocked at the door.

"Comrade lieutenant colonel, may I come in?" a warrant officer appeared in the doorway. "I have a request. I have decided to leave the service."

I noticed that Nikolay Dmitriyevich appeared to be expecting this piece of news. Later he told me that he had been expecting WO A. Marinin and had been hoping that he might change his mind. Korolev could not believe that the job of a TV repairman in a small-town repair shop had suddenly become more important to a veteran military specialist than the job he was presently doing in the subunit.

The commanding officer peered at Marinin, who had fallen silent, waiting to explain his decision. It was really disturbing: he had decided to leave the service after all. But men do not leave a good commanding officer....

"You know, Arkadiy," the battalion commander unexpectedly addressed the warrant officer by his first name, "let me hold your request for the time

being. It's late; tomorrow I'll make the final decision. I'd like to talk about it. Let's walk back to quarters together."

They headed off across the airfield toward the base compound.

"It's really pretty here," the battalion commander paused just short of the concrete runway, which knifed into a birch wood. "But here is a reminder of the war..."

An old birch tree had been disfigured by a shell — a healed-over wound in blackish-brown excrescences. An enemy airfield had occupied this site during the war. It was heavily guarded. Partisans had helped our pilots deliver an airstrike. Their low-powered transmitter had radioed corrections to the Soviet bombers and had provided the command authorities with extremely valuable intelligence. At a decisive moment during the airstrike, the underground communications operators had called fire on themselves, and the fascist airfield was destroyed.

"These were truly brave people," the officer ended his story. "But you too have a military bent: you have the ability correctly to analyze a suddenly-arising situation without hesitation, and you sacrifice yourself for the sake of the common cause...."

The commanding officer and his subordinate had a long talk that evening. The following morning, before Lieutenant Korolev could sign the request, the signal to assemble sounded. The airfield almost immediately swelled with the roar of aircraft engines. Aircraft taxied out to the runway and took off, one after the other. The aircraft currently in line taxied into position. The pitch of its turbines rose to a high note. At this moment the inspecting officer injected a scenario instruction: "The flight operations officer has no communications!"

"It will take considerable time to check the entire circuit," Korolev reflected. "My men and I must immediately find a solution."

Warrant officer Marinin had an interesting and simple suggestion. Following his recommendation, they quickly restored the "disrupted" communications. As a result the pilots successfully accomplished the assigned mission, and the commanding officer commended Warrant Officer Marinin for his precise actions and sharpness of wit. Korolev did not have to sign the warrant officer's separation request. Marinin had changed his mind.

Before my departure, I once again got together with Lt Col N. Korolev in his office. We recalled the card in the envelope. Nikolay Dmitriyevich gingerly removed it from the envelope: "It was sent by Pvt (Res) Mikhail Nakonechnyy. It is a wedding invitation. I remember him well. A reliable comrade and a knowledgeable specialist. That kind of fellow will never let you down."

...After we took off, I glanced back at the airfield which was receding in the distance. It seemed that even from here one could see beyond its bright lights those persons who by their labor ensure the flight safety of those who are carrying out their military duty in a worthy manner in the skies.

After this article was ready for publication we were informed that Lt Col N. Korolev has received a position promotion.

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## CHUKOT PENINSULA BORDER GUARDS PRAISED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 5, May 86 (signed to press 2 Apr 86) p 49

[Article by A. Yefimov: "Sentinels of the Soviet Borders"]

[Text] The borders of the USSR stretch thousands of kilometers. And everywhere -- on the steep, snow-covered slopes of the Pamir and the Caucasus, on the hot sands of the Kara Kum, in the Far-Eastern taiga and the Karelian forests, beyond the Arctic Circle and on the Chukot Peninsula -- Soviet border guards are performing their difficult job, vigilantly standing watch.

The Border Troops, a component part of the USSR Armed Forces, have a glorious fighting history. Established during the first year of existence of the Soviet State, they made a substantial contribution toward victory over domestic and external counterrevolution, and they fought bravely on the battlefronts of the Great Patriotic War. The Border Troops have vigilantly and reliably guarded the borders of our multiethnic homeland in the postwar years.

Today, in conditions of an international situation which has become sharply aggravated through the fault of the aggressive forces of imperialism, the Border Troops perform a special role in guarding the borders of the USSR. Indoctrinated by the Communist Party and totally devoted to the Soviet homeland, our border guards, together with the fighting men of the Army and Navy, are carrying out their sacred duty with honor and dignity, making a contribution toward implementation of the historic decisions of the 27th CPSU Congress and the targets of the 12th Five-Year Plan. Thanks to the party's tireless concern, they have at their disposal today everything they need in order reliably to guard our nation's borders on land and on the sea, resolutely to thwart armed acts of provocation and schemes by foreign agents on our borders, regardless of the mask behind which the border intruders disguise themselves.

Border Troops subunits and units are provided with formidable combat and specialized equipment which meets today's demands. Fast ships and patrol craft, cars and trucks, armored personnel carriers, surveillance, signaling and communications equipment, as well as radars help in reliably guarding the borders. Fixed-wing and rotary-wing aircraft play a special role. Border

guard aviators deliver details to their patrol area, fly airborne patrol, and deliver urgent supplies.

...We accompanied the crew of military pilot Maj V. Chekhobakh on a run to a remote eastern garrison. Heavy clouds hung over the boundless expanses of the Chukot Peninsula. Wind gusts from various directions buffeted the craft, making the flight more difficult. But Major Chekhobakh held the helicopter firmly on course, and this confidence was passed on to the young crew members -- copilot-navigator Lt N. Karnaukhov and flight technician Lt A. Antonenko. One could sense that even externally they were endeavoring to emulate the aircraft commander, striving to be equally precise in all things.

And one can learn a great deal from Chekhobakh, a military pilot 1st class, an instructor pilot, and helicopter squadron executive officer. He has trained a great many pilots to work Arctic routes, he flies night and day in all weather, has on numerous occasions performed distinguished service on the border, is well acquainted with every bit of the border area, and can advise a novice pilot on how to find a landing site, taking into account prominent terrain features, elevation and steepness of the hills, prevailing wind direction, and hardness of the snow crust.

We arrived at the "point" on schedule. Several days later we made the return flight with the same crew. The aircrew performed a combat training mission on the flight back. The Chukot Peninsula looked quite different in clear weather. The smooth surface of the Pacific Ocean sparkled peacefully, and the clearly-defined shoreline meandered back and forth below the helicopter. But the crew did not relax its efforts for a single minute. This is also one of Chekhobakh's rules: to perform each flight with maximum effort, to utilize it in order to improve one's combat skills.

Lieutenant Karnaukhov piloted the helicopter, while Major Chekhobakh briefly gave advice, directing his actions. Yielding to the pilot's will, the helicopter abruptly changed heading and executed vertical maneuvers. The crew kept a close watch on the ground situation.

"Target! Bearing...", Karnaukhov had spotted way off in the distance the barely distinguishable spot of a vessel in Soviet territorial waters.

"I see it!" Chekhobakh nodded approvingly.

The helicopter swung around and headed swiftly toward the vessel. It was one of ours!

The pilot swung back to his former heading and continued the flight. All was quiet along the border....

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